

IDA

INSTITUTE FOR DEFENSE ANALYSES

The 1998 IDA Cost Research Symposium

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19981021 038

August 1998

**Approved for public release;
distribution unlimited.**

IDA Document D-2173

Log: H 98-002091

This work was conducted under IDA's independent research program and contracts DASW01 94 C 0054/DASW01 97 C 0056, Task T-Q7-1138, for the Office of the Secretary of Defense (Program Analysis and Evaluation). The publication of this IDA document does not indicate endorsement by the Department of Defense, nor should the contents be construed as reflecting the official position of that Agency.

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PREFACE

The Institute for Defense Analyses (IDA) prepared this document as part of a project that is jointly sponsored by IDA's Independent Research Program and the Office of the Director, Program Analysis and Evaluation, in the Office of the Secretary of Defense (OSD). The document contains summaries of ongoing cost research tasks at selected government offices, Federally Funded Research and Development Centers, and military universities. These projects were discussed at a meeting held at IDA on 21 May 1998.

The purpose of the document is to make available the material it contains for the use and convenience of those who participated in the meeting, and for other purposes deemed appropriate by the Chairman of OSD's Cost Analysis Improvement Group. The material has not been evaluated, analyzed, or subjected to formal IDA review.

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I. INTRODUCTION

On 21 May 1998, representatives from selected offices and organizations that sponsor and conduct defense cost research met at a symposium at the Institute for Defense Analyses (IDA) to discuss and exchange information on their current research programs. The symposium was jointly sponsored by IDA and the Cost Analysis Improvement Group (CAIG) in the Office of the Secretary of Defense (OSD). Before the meeting, the representatives were asked to prepare summaries of each cost research study in progress or planned at their offices and organizations. This document catalogs those summaries.

A. BACKGROUND

Several Department of Defense (DoD) offices conduct and sponsor research into methods for estimating and monitoring the costs of defense systems and forces. Such efforts improve the technical capabilities of the DoD to forecast future costs in support of planning, programming, budgeting, and acquisition decisions. The CAIG leads the department in improving capabilities in the cost area. IDA supports the CAIG and other offices in these efforts. One example of such support was IDA's initiation in 1989 of an annual defense cost research symposium. This symposium facilitates the exchange of research findings, leads to avoidance of costly duplication of effort, and allows for more informed and coordinated cost research planning among the DoD offices, Federally Funded Research and Development Centers (FFRDCs), and military universities that independently sponsor cost research.

The charter of the CAIG requires an annual review of the plans of all DoD Components for performing or sponsoring cost research [1]. It also requires development of a six-year plan for DoD cost research that allocates resources to the highest priority, avoids duplication of effort, and facilitates sharing of results among the DoD Components. Further, the CAIG is to make available to all interested DoD Components a data base describing completed, ongoing, and planned cost research projects.

The 1998 IDA Cost Research Symposium helped the CAIG fulfill a portion of these responsibilities. During the symposium, the cost research activities of DoD Components were reviewed and arrangements were made among participants for the exchange of research findings, data, and reports. Each year, IDA produces a catalog of the ongoing cost research activities discussed at the symposium. (This document is an example; References [2 through 10] contain similar information from previous years' symposia.) These documents provide information that

can be valuable to DoD Components and FFRDCs when making research planning and resource allocation decisions.

B. ABOUT THE SYMPOSIUM

Representatives of IDA and the OSD CAIG jointly prepared the list of offices and organizations invited to participate in the 1998 symposium. Participation included preparation of research project summaries and attendance at the symposium. Table 1 lists the offices and organizations that accepted our invitation and the names of the individuals who represented them at this year's symposium. The abbreviations and ordering of the offices and organizations in Table 1 are used throughout this document.

Table 1. Participants in the 1998 IDA Cost Research Symposium

| Office/Organization | Abbreviation | Representative |
|--|--------------|--------------------------|
| Office of the Director, Program Analysis and Evaluation | PA&E | Dr. David L. McNicol |
| Ballistic Missile Defense Organization | BMDO | Ms. Donna M. Snead |
| Army Cost and Economic Analysis Center | CEAC | Mr. Robert W. Young |
| Army Materiel Command | AMCRM | Mr. Wayne Wesson |
| Army Tank-automotive and Armaments Command | TACOM | Mr. Richard S. Bazzy |
| Army Aviation and Missile Command ^a | AMCOM | Mr. Carl L. Story |
| Army Space and Strategic Defense Command | SMDC | Mr. Jackson G. Calvert |
| Naval Center for Cost Analysis | NCCA | Dr. Daniel A. Nussbaum |
| Naval Air Systems Command | NAVAIR | Ms. Maria R. Ponti |
| Naval Sea Systems Command | NAVSEA | Mr. Jerome R. Acks |
| Naval Surface Warfare Center, Dahlgren Division | NSWCDD | Mr. John W. Kozicki |
| Naval Surface Warfare Center, Carderock Division | NSWCCD | Mr. Robert R. Jones |
| Air Force Cost Analysis Agency | AFCAA | Mr. Joseph T. Kammerer |
| Aeronautical Systems Center, Air Force Material Command | ASC/FMC | Ms. Kathy L. Watern |
| Air Force Space and Missile Systems Center | AFSMC | Mr. Anthony E. Finefield |
| Electronics Systems Center, Air Force Material Command | ESC/FMC | Ms. Ellen Coakley |
| Ministry of Defence, Special Procurement Services/Cost Forecasting | SPS/CF | Mr. Terry Proffitt |
| Air Force Institute of Technology | AFIT/LAS | MAJ Daryl Hauck |
| Defense Systems Management College | DSMC | LTC Melinda Walsh |
| Aerospace Corporation | AERO | Dr. Stephen A. Book |
| MITRE Corporation | MITRE | Mr. Stephen Gross |
| RAND Corporation | RAND | Mr. Frederick S. Timson |
| Logistics Management Institute | LMI | Mr. Walter R. Cooper |
| Center for Naval Analyses ^a | CNA | Mr. Doug Adams |
| Institute for Defense Analyses | IDA | Dr. Stephen J. Balut |

^a These two offices/organizations did not submit project summaries this year.

The symposium was held in the spring to correspond with the CAIG's schedule for updating the DoD's Six-Year Cost Research Plan [11 and 12]. Budget decisions related to such studies are usually made during the summer. These decisions will be better informed because they will be made in light of the information disseminated at the symposium and contained in this document.

The agenda for the 1998 symposium is shown in Table 2.

Table 2. Agenda

| |
|--|
| Welcome |
| Dr. Stephen J. Balut, <i>Institute for Defense Analyses</i> |
| Keynote Address |
| Dr. David L. McNicol, <i>Cost Analysis Improvement Group</i> |
| Background |
| Dr. Stephen J. Balut, <i>Institute for Defense Analyses</i> |
| Fixed Wing Aircraft |
| Ms. Theresa O'Brien, <i>Air Force Cost Analysis Agency</i> |
| Rotary Wing Aircraft |
| Ms. Theresa O'Brien, <i>Air Force Cost Analysis Agency</i> |
| Electronics |
| Mr. Richard Collins, <i>Naval Center for Cost Analysis</i> |
| Information Systems |
| Mr. Richard Collins, <i>Naval Center for Cost Analysis</i> |
| Ships |
| Mr. Richard Collins, <i>Naval Center for Cost Analysis</i> |
| Missiles |
| Mr. Richard Bishop, <i>Army Cost and Economic Analysis Center</i> |
| Ground Vehicle Systems |
| Mr. Richard Bishop, <i>Army Cost and Economic Analysis Center</i> |
| Space Systems |
| Ms. Theresa O'Brien, <i>Air Force Cost Analysis Agency</i> |
| Ordnance |
| Mr. Richard Bishop, <i>Army Cost and Economic Analysis Center</i> |
| Forces/Infrastructure |
| Mr. Donald Tison, <i>Office of Secretary of Defense (PA&E)</i> |
| Roadmap |
| Dr. Vance Gordon, <i>Office of Secretary of Defense (PA&E)</i> |
| Cost of Stealth |
| Dr. J. Richard Nelson, <i>Institute for Defense Analyses</i> |

Following the Keynote Address by David McNicol, Chairman of the OSD CAIG, Stephen Balut of IDA set the stage for a sequence of nine presentations provided by Theresa O'Brien of the Air Force Cost Analysis Agency, Richard Bishop of the Army Cost and Economic Analysis Center, and Richard Collins of the Naval Center for Cost Analysis. These presentations

paralleled and built on related presentations given at the 31st Annual DoD Cost Analysis Symposium (DoDCAS) conducted on February 3–6, 1998, in Williamsburg, Virginia. At the DoDCAS in February, these same representatives from the Military Departments described the status of DoD's ability to estimate the costs of weapon systems [13] by different commodity groups (e.g. aircraft, missiles, ships). Capabilities were assessed at each major milestone for major work breakdown structure (WBS) elements. Weaknesses were highlighted and identified as areas requiring additional research effort. At the symposium in May, those assessments were summarized and the speakers identified ongoing research tasks that addressed the areas of weakness.

The commodity group presentations were followed by a presentation by Donald Tison, Director of OSD's Force and Infrastructure Cost Analysis Division, that addressed ongoing research in the forces and infrastructure areas. Then Vance Gordon, cost analyst in the OSD CAIG, placed the supply of ongoing research, as discussed by earlier presenters, into perspective with the demand for cost research, as indicated by upcoming Defense Acquisition Board milestone reviews. The final presentation of the day was provided by J. Richard Nelson of IDA on the subject of the cost to build stealth characteristics into weapon systems.

C. USING THE CATALOG

This document was designed to facilitate a search for information on a specific topic. This is how the document's pertinent sections can be used:

- *Table 3, Keyword Assignments.* In the table, the rows represent keywords and the columns represent offices and organizations. The number at the intersection of a row and column is the number of studies by the office or organization (column) that have the keyword (row) associated with them.
- *Section II, Study Titles.* This section lists the study titles for tasks summarized in Section III. The titles, grouped according to the office or organization performing the study, appear in the order in which they were submitted to IDA.
- *Section III, Summaries.* This section is divided into subsections, one for each office and organization that contributed project summaries. The first part of each section describes the office or organization (name, location, director,¹ size, etc.).² Following that are summaries of research tasks the office or organization reported as being in progress or planned at the time of the symposium. Near the end of each summary is a list of keywords the director of the office or organization assigned to the task. (In several cases, the author modified the keywords for consistency.)

¹ Though their actual titles vary, the heads of the offices/organizations are referred to as "directors" in this document.

² This description is absent if the office/organization did not provide one.

Finding tasks on a specific topic is accomplished as follows: (1) scan the row representing the topic in Table 3 to identify the offices and organizations that are conducting studies on that topic; (2) scan the list of study titles for those offices and organizations in Section II; and (3) refer to the appropriate summaries in Section III.

D. HOW TASKS COMPARE TO THE PLAN

Some readers may be interested in how the tasks in this catalog align with the topics listed in the latest version of the Six-Year Cost Research Plan. Tables 4 and 5 have been included for this purpose. Table 4 lists the research categories first presented in January 1993 [11] and later modified in April 1993 [12]. The participating offices and organizations assigned the relevant numeral-letter-number codes from Table 4 to each of their tasks. Table 5 shows the number of projects in each category by office/organization.

Table 3. Keyword Assignments

| PERSPECTIVE | PA&E | BMDO | CEAC | AMCRM | TACOM | SMDC | NCGA | NAVAIR | NAVSEA | NSWCDD | NSWCDD | AFCAA | ASC/FMC | AFSMC | ESC/FMC | SPS/CF | AFT/LAS | DSMC | AERO | MITRE | RAND | LMI | IDA | TOTAL |
|---------------------------------|------|------|------|-------|-------|------|------|--------|--------|--------|--------|-------|---------|-------|---------|--------|---------|------|------|-------|------|-----|-----|-------|
| Industry | 5 | 2 | — | — | — | — | 1 | 5 | 6 | — | — | 2 | 1 | — | 2 | — | 1 | 1 | 1 | — | 1 | 1 | 6 | 36 |
| Government | 13 | 3 | 22 | 1 | 1 | — | 26 | 13 | 6 | 2 | 10 | 16 | 6 | 5 | 6 | 2 | 21 | 1 | 1 | 6 | — | 9 | 29 | 199 |
| CONTEXT | | | | | | | | | | | | | | | | | | | | | | | | |
| Estimating | 6 | 5 | 18 | — | 1 | 3 | 17 | 8 | 7 | 2 | 4 | 12 | 5 | 5 | 5 | 2 | 8 | — | 5 | 3 | 2 | 10 | 13 | 141 |
| Analysis | 4 | — | 18 | 1 | — | — | 13 | 7 | 6 | — | 9 | 15 | 4 | — | 4 | — | 15 | — | — | 2 | 1 | 9 | 14 | 122 |
| Reviewing/Monitoring | 3 | — | — | — | — | — | — | — | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | 2 | 8 |
| Policy | — | — | — | — | — | — | 1 | — | — | — | 1 | — | — | — | — | — | 2 | — | 1 | — | — | — | 6 | 11 |
| Programming | 4 | — | — | — | — | — | 2 | — | 1 | — | — | 1 | — | — | — | — | — | — | — | — | 1 | 9 | 13 | 32 |
| Budgeting | — | — | 4 | — | — | — | 2 | — | 2 | — | — | — | — | — | — | — | 1 | — | — | — | 9 | 4 | 23 | |
| OBJECT | | | | | | | | | | | | | | | | | | | | | | | | |
| Forces | 5 | — | 4 | — | — | — | — | — | — | — | — | 2 | — | — | — | — | — | — | — | — | — | — | — | 23 |
| Weapon Systems | 4 | 5 | 7 | 1 | 1 | — | 4 | 4 | 1 | — | — | 7 | 4 | 1 | 6 | 1 | — | — | — | — | 1 | 3 | 14 | 29 |
| Aircraft | 1 | — | 2 | — | — | — | 4 | 12 | 1 | — | — | 7 | 3 | 1 | — | — | 3 | — | — | — | — | 4 | 4 | 54 |
| Helicopters | — | — | — | — | — | — | 1 | 7 | — | — | — | — | — | — | — | — | 5 | — | — | — | — | — | 4 | 40 |
| Missiles | — | — | 1 | — | — | 3 | 6 | 2 | — | 2 | — | 6 | — | 1 | — | — | 1 | — | — | — | — | — | 4 | 12 |
| Ships | — | — | — | — | — | — | 3 | — | 8 | — | 7 | — | — | — | — | 1 | — | — | — | 1 | 3 | 26 | — | |
| Land Vehicles | — | — | 1 | — | — | — | — | — | 1 | — | — | — | — | — | — | 1 | — | — | — | — | — | 1 | 20 | |
| Space Systems | — | — | 1 | — | — | — | 1 | — | — | — | — | 4 | — | 5 | — | — | 1 | — | 4 | 1 | — | 1 | 3 | |
| Airframe | — | — | — | — | — | — | — | 2 | — | — | — | 1 | 1 | — | — | — | 1 | — | — | — | — | 2 | 19 | |
| Propulsion | — | — | — | — | — | — | — | 4 | — | — | — | — | — | — | — | — | 1 | — | — | — | 1 | 1 | 7 | |
| Electronics/Avionics | — | — | — | — | — | 3 | 8 | 8 | 2 | — | 2 | 1 | 4 | 1 | 4 | — | 1 | — | — | 2 | 1 | — | — | 6 |
| Spares/Logistics | — | — | — | — | — | — | — | 3 | — | — | — | 2 | — | — | — | — | 1 | — | — | — | — | — | — | 41 |
| Facilities | 2 | — | 3 | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | 1 | — | — | — | — | 5 |
| Infrastructure | — | — | 5 | — | — | — | 3 | — | 1 | — | — | 1 | — | — | — | — | — | — | — | — | 3 | 4 | 17 | |
| Manpower/Personnel | — | — | 1 | — | — | — | 2 | 1 | — | — | — | — | — | — | 1 | — | 1 | — | 1 | — | 1 | 3 | 11 | |
| STAGE | | | | | | | | | | | | | | | | | | | | | | | | |
| Concept Development | — | — | — | — | — | — | — | — | 1 | — | 6 | — | — | — | — | 1 | 1 | — | 1 | — | — | — | — | 10 |
| Demonstration/Validation | 3 | — | — | — | — | — | 1 | — | — | — | 2 | — | 1 | — | — | 1 | — | — | — | — | — | — | — | 8 |
| EMD | 3 | 1 | — | — | — | — | 8 | 5 | — | 2 | — | 6 | 3 | 3 | 2 | 1 | 4 | — | — | — | — | — | — | 45 |
| Production | 3 | — | — | — | — | — | 7 | 5 | 5 | 2 | 2 | 7 | 2 | 3 | — | — | 2 | — | 2 | — | 1 | 1 | 8 | 50 |
| Test and Evaluation | — | — | — | — | — | — | — | — | — | 2 | — | 1 | — | — | — | — | 7 | — | — | — | — | 2 | 4 | 4 |
| Operations and Support | — | 1 | 4 | — | — | — | 12 | 6 | — | — | — | — | — | 1 | — | — | — | — | — | — | 2 | 8 | 45 | |
| Retirement and Demilitarization | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 |
| Life Cycle | 3 | 3 | — | 1 | 1 | — | 4 | 3 | 2 | — | 4 | 11 | 3 | 1 | — | — | 4 | — | 2 | 1 | — | 8 | 51 | |
| FOCUS | | | | | | | | | | | | | | | | | | | | | | | | |
| Labor | 2 | — | — | — | — | — | 1 | 4 | 3 | — | 5 | 8 | — | — | 2 | — | 3 | — | 1 | — | — | 2 | 31 | |
| Material | 3 | — | — | — | — | — | 1 | 2 | 4 | — | 4 | 8 | — | — | — | — | — | — | 1 | — | — | 1 | 24 | |
| Overhead/Indirect | 2 | — | — | — | — | — | — | 3 | — | — | 4 | 2 | — | — | 1 | — | 1 | — | — | — | — | 5 | 18 | |
| Engineering | 1 | 1 | — | — | — | — | — | 1 | 4 | — | 2 | — | 3 | — | 1 | — | — | — | 3 | — | 1 | 1 | 18 | |
| Manufacturing | — | — | — | — | — | — | 1 | 2 | 2 | — | 4 | 3 | 3 | — | — | — | — | — | — | — | 1 | 2 | 19 | |
| CPR/CCDR | — | — | 2 | — | — | — | 1 | — | — | — | — | — | 1 | — | 1 | — | 3 | — | — | — | — | — | 8 | — |
| WBS | — | — | 1 | — | — | — | — | — | 5 | — | 1 | — | — | 4 | — | — | — | — | — | — | — | 2 | 13 | |

(Continued on the next page.)

Table 3—Continued

| FOCUS (continued) | P&E | BMD | CEAC | AMCRM | TACOM | SMD | NCA | NAVSEA | NSWCDD | NSWCDD | AFCAL | ASC/FMC | AFSMC | ESC/FMC | SPS/CF | AFT/LAS | DSMC | AERO | MITRE | RAND | LMI | IDA | TOTAL | |
|--------------------------|-----|-----|------|-------|-------|-----|-----|--------|--------|--------|-------|---------|-------|---------|--------|---------|------|------|-------|------|-----|-----|-------|-----|
| Fixed Costs | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | 2 | — | — | 1 | — | — | 3 | 3 | 10 |
| Variable Costs | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | 2 | — | — | 1 | — | — | 3 | 4 | 11 |
| Production Rate | — | — | — | — | — | — | 2 | — | — | — | — | — | — | — | — | 2 | — | — | 1 | — | — | 3 | 1 | 3 |
| Acquisition Strategy | 3 | — | — | — | — | — | 1 | 3 | — | — | — | — | — | 2 | — | — | — | 1 | 1 | — | 1 | 10 | 26 | |
| Automation | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | 6 | |
| Advanced Technology | 1 | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | 1 | 1 | — | — | — | 9 | |
| Risk/Uncertainty | 2 | 1 | — | — | — | — | 4 | — | — | — | — | — | — | — | — | — | — | 1 | 1 | — | — | 2 | 15 | |
| Training | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | |
| Readiness | — | — | — | — | — | — | — | 4 | 1 | — | — | — | — | — | — | — | — | 1 | — | — | — | 1 | 7 | |
| Reliability | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2 | |
| Sustainability | — | — | — | — | — | — | 5 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7 | |
| Integration | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | 4 | |
| Modification | — | — | — | — | — | — | — | 1 | 2 | — | — | 2 | 1 | — | — | — | — | — | — | — | — | 1 | 6 | |
| Security | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0 | |
| Environment | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2 | |
| Schedule | 2 | — | — | — | — | — | 3 | — | — | — | 2 | — | — | — | — | — | — | — | — | — | — | 3 | 10 | |
| Size | — | — | — | — | — | — | — | — | — | 3 | — | — | 2 | — | — | — | — | — | 5 | — | — | — | 5 | |
| Software | 1 | — | — | — | — | — | 4 | — | — | — | — | — | — | — | 1 | 2 | — | — | — | — | — | 1 | 10 | |
| APPROACH | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Collection | 4 | — | 8 | — | — | — | 14 | 8 | 5 | — | 7 | 14 | 2 | 4 | 3 | 1 | 12 | 1 | 4 | 1 | 1 | 10 | 14 | 113 |
| Survey | — | — | — | — | — | — | — | — | 2 | — | 1 | — | 1 | 3 | — | 3 | — | — | — | 1 | — | — | 2 | 13 |
| Case Study | 1 | — | 2 | — | — | — | — | — | — | — | — | — | — | — | — | 3 | — | — | 1 | 1 | — | — | 4 | 14 |
| Mathematical Modeling | 2 | 1 | — | — | — | — | 6 | 3 | 3 | — | 6 | 5 | 2 | 1 | — | 2 | 2 | — | 2 | 2 | — | 8 | 13 | 58 |
| Economic Analysis | — | — | — | — | — | — | — | 1 | 2 | — | — | — | — | — | — | 1 | — | — | — | — | — | 5 | 9 | |
| Cost/Production Function | — | — | — | — | 1 | — | — | — | 2 | — | — | — | — | — | — | — | — | — | — | — | — | 2 | 6 | |
| Time Series | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | 2 | 3 | |
| Statistics/Regression | — | — | — | 1 | — | — | 13 | 3 | — | 2 | 8 | 3 | — | 2 | — | — | 4 | — | 1 | — | 1 | 9 | 6 | 53 |
| PRODUCT | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Base | 4 | 1 | 13 | — | — | — | 18 | 4 | 3 | — | 6 | 13 | — | 4 | 2 | — | — | 1 | 2 | — | — | 15 | 87 | |
| Review | 2 | — | — | — | — | — | — | 1 | — | — | 1 | — | 1 | — | — | — | — | 1 | — | — | — | 5 | 11 | |
| Method | — | — | — | — | — | 3 | 11 | 7 | 2 | — | 4 | 3 | — | 3 | 1 | — | — | — | — | 2 | — | 4 | 40 | |
| Mathematical Model | — | — | — | — | — | — | 2 | — | 2 | 2 | 7 | — | — | 1 | — | 1 | — | — | — | — | — | 1 | 18 | |
| Computer Model | 2 | 1 | — | — | 1 | — | 4 | 4 | 5 | — | 7 | 5 | 2 | — | 1 | 2 | — | 4 | — | 1 | 3 | 12 | 54 | |
| Expert System | 1 | — | — | 1 | — | — | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | 4 | |
| Cost Progress Curve | — | 1 | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2 | |
| CER | — | 1 | 4 | — | — | 1 | 11 | 6 | 1 | — | 4 | 7 | — | 2 | 1 | — | — | 1 | — | — | 1 | 3 | 44 | |
| Study | 5 | — | 2 | — | — | — | 10 | 4 | 2 | — | 4 | — | 1 | 1 | — | 20 | — | 1 | — | 1 | 1 | 11 | 63 | |

Table 4. Research Categories

I. Themes for Special Emphasis

- A. Measuring the savings from Acquisition Streamlining
- B. Cost estimating techniques for the new acquisition environment
 - 1. Selective upgrading of existing systems
 - 2. Selective low-rate procurements
- C. Cost estimation for Major Defense Acquisition Programs (MDAPs) in the EMD stage
 - 1. Methods for highlighting dependency on new technologies that either will become significant cost items in their own right or may set the pace of the program
 - 2. Techniques for determining technical and schedule uncertainties in ways that facilitate rational evaluation of their cost impact
- D. Techniques for estimating environmental cost throughout an MDAP's life cycle

II. Maintenance-of-the-toolbox themes

- A. Sustain the effectiveness of established tools
 - 1. Updates to incorporate recent experience
 - 2. Improvements to broaden scope or enhance methods
 - B. Incorporate new analysis techniques
 - C. Make progress on difficult problems that previously have eluded solution
 - D. Explore new ideas to establish their suitability for improving cost analysis
-

Table 5. Tabulation by Research Category

| | PA&E | BMDO | CEAC | AMCRM | TACOM | SMDC | NCCA | NAVIAIR | NAVSEA | NSWCDD | NSWCDD | AFCAA | ASC/FMC | AFSMC | ESC/FMC | SPS/CF | AFT/LAS | DSMC | AERO | MITRE | RAND | LMI | IDA | TOTAL |
|--------|------|------|------|-------|-------|------|------|---------|--------|--------|--------|-------|---------|-------|---------|--------|---------|------|------|-------|------|-----|-----|-------|
| I | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0 |
| IA | — | — | — | — | — | — | — | 2 | — | — | — | — | 1 | — | — | — | 2 | — | — | — | — | 1 | — | 6 |
| IB | 1 | — | — | — | — | — | — | — | 1 | — | — | 2 | — | — | 1 | — | 2 | 1 | 2 | — | — | — | 1 | 11 |
| IB.1 | — | — | 1 | — | — | — | 1 | 1 | — | — | — | 1 | 1 | — | — | — | — | — | — | — | — | — | 3 | 8 |
| IB.2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0 |
| IC | 1 | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | 3 |
| IC.1 | 2 | — | — | — | — | — | — | 1 | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | 4 |
| IC.2 | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | — | — | — | 4 | 6 |
| ID | 1 | — | — | — | — | — | — | — | — | — | — | 1 | — | 1 | — | — | — | — | — | — | — | — | 1 | 4 |
| II | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | — | — | — | — | — | — | 3 |
| II.A | 1 | — | — | — | — | — | 1 | 3 | 1 | — | 1 | 3 | 2 | — | — | — | — | — | 2 | — | — | 9 | 3 | 26 |
| II.A.1 | 1 | — | 18 | 1 | — | — | 11 | 5 | 1 | — | 1 | 1 | 1 | 2 | — | — | 9 | — | 1 | — | 1 | — | 12 | 65 |
| II.A.2 | 4 | 7 | 16 | 1 | — | 3 | 12 | 3 | 2 | — | 5 | 10 | — | 4 | — | — | 5 | — | 1 | — | 1 | 1 | 13 | 88 |
| II.B | — | — | 1 | — | 1 | — | 6 | 5 | 3 | — | 6 | 5 | 2 | 1 | 3 | — | 2 | — | 2 | 2 | — | — | 11 | 50 |
| II.C | 4 | — | 2 | — | — | — | 13 | 1 | 2 | 2 | 1 | 2 | — | — | 1 | 2 | 1 | — | 3 | — | 1 | 1 | 10 | 46 |
| II.D | — | — | — | — | — | — | 6 | — | 1 | — | 3 | — | — | 1 | — | — | 6 | — | 4 | 1 | — | 1 | 2 | 25 |

II. STUDY TITLES

Office of the Director, Program Analysis and Evaluation

| | |
|---------|--|
| PA&E-1 | Force and Support Cost (FSC) System |
| PA&E-2 | Force and Support Cost (FSC) System and FYDP Support—VGS |
| PA&E-3 | Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems |
| PA&E-4 | Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems |
| PA&E-5 | Improved Software Cost Reporting Processes for Weapon Systems |
| PA&E-6 | Selected Acquisition Report (SAR) Cost Variance Analysis |
| PA&E-7 | Demilitarization and Disposal Costs of Tactical Aircraft |
| PA&E-8 | Developing Cost Estimating Relationships for the Streamlined Manufacturing Environment |
| PA&E-9 | IDA Cost Research Symposium |
| PA&E-10 | Cost Analysis of Advanced Materials |
| PA&E-11 | Cost of Developing and Producing Next Generation Tactical Aircraft |
| PA&E-12 | Contractor Cost Data Reporting (CCDR) Clearinghouse/Repository |
| PA&E-13 | CAIG Information Center Support |
| PA&E-14 | Improved Methodology for Projection of Development Costs |

Ballistic Missile Defense Organization

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|--------|---|
| BMDO-1 | Automated CER Data Base |
| BMDO-2 | BMDO Operating & Support Cost Estimating |
| BMDO-3 | BMDO Cost Risk Research |
| BMDO-4 | Cost Drivers Analysis |
| BMDO-5 | Fixed Site Early Warning Radars |
| BMDO-6 | Development CERS |
| BMDO-7 | EMD Learning Slope and the Prototype to Production Step-Down Factor |

Army Cost and Economic Analysis Center

| | |
|--------|--|
| CEAC-1 | Update FORCES Cost Model, EFCDB, Cost Factor Handbook |
| CEAC-2 | Crosswalk ISR Cost Factors into FORCES Cost Model |
| CEAC-3 | FORCES Deployment Cost Model |
| CEAC-4 | Installation Status Report (ISR) Part1, (Infrastructure) Revision and Update |
| CEAC-5 | The Army Manpower Cost System (AMCOS) |
| CEAC-6 | ACEIT/ACDB |
| CEAC-7 | Communications and Electronics Cost Data Base/Methodology |
| CEAC-8 | Operating and Support Management Information System (OSMIS) Data Base Management |
| CEAC-9 | Operating and Support Management Information System (OSMIS) Output Products |

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| CEAC-10 | Operating and Support Management Information System (OSMIS) Special Studies |
| CEAC-11 | Aircraft Module Data Base Migration and Methodology Enhancement |
| CEAC-12 | Missile Module of ACDB |
| CEAC-13 | Wheel and Tracked Combat Vehicle Data Base and Methodology Development |
| CEAC-14 | Performance Affordability Assessment Model (PAAM) |
| CEAC-15 | Standard Service Costing (SSC) |
| CEAC-16 | Leadership Training Materials for Activity Based Cost (ABC) |
| CEAC-17 | Standard Service Costing (SSC) FY98 Cost Factors |
| CEAC-18 | ACEIT Economic Analysis Applications |
| CEAC-19 | ACEIT WIN Enhancements |
| CEAC-20 | ACDB Enhancements |
| CEAC-21 | Development of Leadership Resources for Activity Based Costing (ABC) |
| CEAC-22 | Link Activity Based Costs (ABC) to Service Based Costs (SBC) |
| CEAC-23 | Aircraft Module Data Base Transition |

Army Materiel Command

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|---------|---|
| AMCRM-1 | ACE-IT Verification and Validation Tool |
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Army Tank-Automotive and Armaments Command

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|---------|---|
| TACOM-1 | Performance Affordability Assessment Model (PAAM) |
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Army Space and Strategic Defense Command

| | |
|--------|---------------------------------|
| SMDC-1 | Software Cost Estimating |
| SMDC-2 | Laser Research |
| SMDC-3 | Multi-Mode Seeker Cost Research |

Naval Center for Cost Analysis

| | |
|---------|--|
| NCCA-1 | Top-Level Ship Operating and Support Cost Model |
| NCCA-2 | Ship Operating and Support Cost Analysis Model (OSCAM-Ship) |
| NCCA-3 | Shipboard Systems Operating and Support Cost Analysis Model (OSCAM-Sys) |
| NCCA-4 | Aircraft Operating and Support Cost Model |
| NCCA-5 | Avionics Operating Support Cost Model |
| NCCA-6 | Missile Torpedo Operating and Support Cost Model |
| NCCA-7 | Cost of a Sailor Study |
| NCCA-8 | Cost of Manpower Estimating Tool (COMET) |
| NCCA-9 | Integration of Navy VAMOSC Database into a Relational Database Management System |
| NCCA-10 | Expansion of VAMOSC Shipboard System Database |
| NCCA-11 | Indirect Cost Database Related to the VAMOSC Database |
| NCCA-12 | Linkage Between VAMOSC and the PPBS |
| NCCA-13 | Platform Integration Cost Database/Model for Electronics |
| NCCA-14 | Government In-House Cost Database/Estimating Methodology |
| NCCA-15 | Missile Special Tooling and Test Equipment Cost Estimating Relationship |

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| NCCA-16 | Rotary Wing Aircraft Cost Database |
| NCCA-17 | Missile Development Cost Estimating Method |
| NCCA-18 | Electronics/Cost Technical Database |
| NCCA-19 | MADCAM (Microwave and Digital Cost Analysis Model) |
| NCCA-20 | Transmit/Receive (T/R) Module Update |
| NCCA-21 | Software Development Estimating Handbook - Phase One |
| NCCA-22 | Weapon System Software Development Cost/Technical Database |
| NCCA-23 | Weapon System Software Development Estimating Methodology Update |
| NCCA-24 | Weapon System Software Maintenance Cost/Technical Database Estimating Methodology |
| NCCA-25 | Automated Information System (AIS) Software Development Estimating Methodology |
| NCCA-26 | Price Indices for Computers |
| NCCA-27 | Commodity Investment Balance Assessment (CIBA) Model |

Naval Air Systems Command

| | |
|-----------|---|
| NAVAIR-1 | Joint Strike Fighter (JSF) Advanced Cost Analysis Support (Cost of Stealth) |
| NAVAIR-2 | Naval Aviation Modification Model (NAMM) Data Base |
| NAVAIR-3 | Maintenance Trade Decision Support System |
| NAVAIR-4 | Maintenance Trade Guidebook |
| NAVAIR-5 | NAVAIR Operating and Support Cost Model |
| NAVAIR-6 | SBIR Life Cycle Cost Model Development |
| NAVAIR-7 | System Engineering/Program Management Cost for Missile Development and Production |
| NAVAIR-8 | Aircraft Learning Curve Trends Over Time |
| NAVAIR-9 | Production Cross Checks for Fighter Aircraft and Helicopters |
| NAVAIR-10 | Data for Propulsion O&S Model |
| NAVAIR-11 | Platform Integration Study |
| NAVAIR-12 | Commodity Specific Escalation Indices |
| NAVAIR-13 | Life Cycle Cost Simulation Model |
| NAVAIR-14 | Estimating Avionics Program Support Costs for Engineering and Manufacturing Development Contracts |

Naval Sea Systems Command

| | |
|----------|--|
| NAVSEA-1 | Private Shipbuilder Overhead Costs and Savings from Initiatives |
| NAVSEA-2 | Shipbuilding Process Simulation Model |
| NAVSEA-3 | Early Warning System (EWS) Integration |
| NAVSEA-4 | Material Vendor Survey |
| NAVSEA-5 | AACEI Cost Model for Aircraft Carriers |
| NAVSEA-6 | SEA 0177 Shipyard Workload Model Improvements |
| NAVSEA-7 | COTS Electronic Technology Assessment/Refresh Cost Model |
| NAVSEA-8 | Total Ownership Cost Reduction Process and Templates |
| NAVSEA-9 | Government Furnished Equipment/Materiel (GFE/GFM) Process Improvement Initiative |

Naval Surface Warfare Center, Dahlgren Division

| | |
|----------|---|
| NSWCDD-1 | TBMD Missile Model |
| NSWCDD-2 | RDT&E Development Support CERs for Radar Programs |

Naval Surface Warfare Center, Carderock Division

| | |
|-----------|--|
| NSWCCD-1 | Cost Module for Sealift Ship Version of ASSET |
| NSWCCD-2 | Product-Oriented Design and Construction (PODAC) Cost Model |
| NSWCCD-3 | Surface Combatant Performance-Based Life Cycle Cost Model (PBCM) |
| NSWCCD-4 | Navy Force Affordability Model (NFAM) |
| NSWCCD-5 | Nuclear Attack Submarine Technology-Based Parametric Cost Model |
| NSWCCD-6 | Analysis of Operation and Support (O&S) Costs for Aircraft Carriers |
| NSWCCD-7 | Aircraft Carrier Performance-Based Life Cycle Cost Model and Present Value Analysis Modeling |
| NSWCCD-8 | Arsenal Ship Operating and Support Cost Model |
| NSWCCD-9 | Aircraft Carrier Cost-Benefit Analysis Model |
| NSWCCD-10 | USCG Performance-Based Life Cycle Cost Model |

Air Force Cost Analysis Agency

| | |
|----------|---|
| AFCAA-1 | NAFCOM |
| AFCAA-2 | Crosslinks Payload Data Collection and CER Development |
| AFCAA-3 | Missiles ACDB Update |
| AFCAA-4 | Below-the-Line Cost Study for Missiles and Munitions |
| AFCAA-5 | Weapon System Case Growth Study |
| AFCAA-6 | Below-the-Line In-House Cost Research Study |
| AFCAA-7 | Multi-Aircraft Database Normalization |
| AFCAA-8 | Price H Composite Material Calibration |
| AFCAA-9 | Aircraft Database Study Follow-On |
| AFCAA-10 | Avionics Systems Data Collection |
| AFCAA-11 | Overhead Study |
| AFCAA-12 | Long Range Planning O&S Cost Models |
| AFCAA-13 | Integrated Force and Infrastructure Cost Model (IFICM) |
| AFCAA-14 | Force Analysis Decision Support System ACEIT Enhancements |
| AFCAA-15 | Air Force Total Ownership Cost (AFTOC) |
| AFCAA-16 | ACEIT Upgrades/RISK Integration |

Air Force Materiel Command/Aeronautical Systems Center

| | |
|-----------|--|
| ASC/FMC-1 | Advanced Aircraft Cost Forecasting Model (AAFCM) |
| ASC/FMC-2 | Automated Model for Integrating Cost with Operational Effectiveness |
| ASC/FMC-3 | PRICE Model Calibration Studies |
| ASC/FMC-4 | Integrated Desktop Analysis and Planning System (IDAPS) Concept Evaluation (ICE) |
| ASC/FMC-5 | Case Study, APG-63 V(1) Radar, F-15 |
| ASC/FMC-6 | Avionics Support Cost Factors Update |

Air Force Space and Missile Systems Center

| | |
|---------|--|
| AFSMC-1 | Hazardous Materials Disposal Cost Study |
| AFSMC-2 | Operations and Support (O&S) Database |
| AFSMC-3 | Passive Sensor Cost Model Update |
| AFSMC-4 | Software Database |
| AFSMC-5 | Unmanned Spacecraft Cost Model (USCM) Update |

Air Force Electronics Systems Center

| | |
|-----------|--|
| ESC/FMC-1 | Labor Analysis Process & Automation for Estimating & Proposal Evaluation |
| ESC/FMC-2 | Use of Automated Cost Estimator-Integrated Tools (ACE-IT) for Cost Proposal Evaluation and the Storage of Cost/Schedule/Technical Data |
| ESC/FMC-3 | Industry/Government C ² Cost Working Group |
| ESC/FMC-4 | C ² Cost Information Center Web Site |
| ESC/FMC-5 | "Open" Estimating Tool for Software-Intensive Programs with COTS H/W & S/W |
| ESC/FMC-6 | "NOW" Data Collection Process & Analysis |

Ministry of Defence, Special Procurement Services/Cost Forecasting

| | |
|----------|---|
| SPS/CF-1 | Software Support Cost Model Project (SSCMP) |
| SPS/CF-2 | Operating and Support Costs Analysis Models (OSCAM) |

Air Force Institute of Technology

| | |
|-------------|--|
| AFIT/LAS-1 | Calibration and Validation of the Cocomo Ii. 1997.0 Cost/Schedule Estimating Model to the Space and Missiles Systems Center Database |
| AFIT/LAS-2 | A Cost-Benefit Analysis of Earned Value Management Systems Criteria |
| AFIT/LAS-3 | An Examination of the Demographics and Career Progression of Air Force Institute of Technology Cost Analysis Graduates |
| AFIT/LAS-4 | The Determinants of the Housing Choices of Military Families: Implications for Military Policy |
| AFIT/LAS-5 | Factors Affecting the Unit Cost of Weapon Systems |
| AFIT/LAS-6 | Calibration and Validation of the Sage Software Cost/Schedule Estimating System to United States Air Forces Databases |
| AFIT/LAS-7 | Calibration and Validation of the Checkpoint Model to the Air Force Electronic Systems Center Software Database |
| AFIT/LAS-8 | A Study of Historical Inflation Forecasts Used in the Department of Defense Future Years Defense Program |
| AFIT/LAS-9 | Tracking Overhead Orta Costs in Technology Transfer Activities |
| AFIT/LAS-10 | The Impact of the Packard Commission's Recommendations on Reducing Cost Overruns in Major Defense Acquisition Programs |
| AFIT/LAS-11 | Estimating KC-137 Aircraft Ownership Costs in the Brazilian Air Force (BAF) |
| AFIT/LAS-12 | Economic Analysis for an F-22 Organic vs. Contractor Aircraft Battle Damage Repair Ownership Decision |
| AFIT/LAS-13 | A Preliminary Study of Using the SEI's Capability Maturity Model to Set Statistical Control Bounds on DoD Contractor Cost and Schedule Performance |
| AFIT/LAS-14 | Cost Per Flying House Analysis of the C-141 |

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| AFIT/LAS-15 | Activity-Based Costing in Logistics |
| AFIT/LAS-16 | A Return on Investment Model for Technology Transfer |
| AFIT/LAS-17 | Multinational Communications Satellite Cost Study |
| AFIT/LAS-18 | Fighter CERS and Seemingly Unrelated Regressions |
| AFIT/LAS-19 | Software Support Cost Estimating Models: a Comparative study of What the Models Estimate |
| AFIT/LAS-20 | A Quantitative Cost Analysis of the First High Altitude Endurance Unmanned Aerial Vehicle – the Global Hawk |
| AFIT/LAS-21 | Predictive Reliability of the Contractor Performance Assessment Report (CPAR) Process |
| AFIT/LAS-22 | Cost/Benefit Analysis of Air Refueling Options for the North Pacific Theatre |

Defense Systems Management College

| | |
|--------|---|
| DSMC-1 | Research on Ongoing Acquisition Research (ROAR) |
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Aerospace Corporation

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|--------|---|
| AERO-1 | Costs of Space, Launch, and Ground Systems |
| AERO-2 | Validation Testing of Commercial Risk-Analysis Software |
| AERO-3 | Small-Satellite Cost Engineering Model |
| AERO-4 | Small-Satellite Cost Study |
| AERO-5 | Ground Systems Cost Model |
| AERO-6 | Formation of Corporate Concept Design Center |

MITRE Corporation

| | |
|---------|---|
| MITRE-1 | A Predictive Pricing Model for Asynchronous Transfer Mode (ATM) Public Services |
| MITRE-2 | G-Cost Model |
| MITRE-3 | Trends in the Development of Optoelectronics over the Next Ten to Fifteen Years |

RAND Corporation

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|--------|---|
| RAND-1 | Force Structure and Support Infrastructure Costing for Program Analysis and Evaluation |
| RAND-2 | The Cost of Future Military Aircraft: Historical Cost Estimating Relationships and Cost Reduction Initiatives |

Logistics Management Institute

| | |
|-------|--|
| LMI-1 | Empirical Analysis of Learning Curves |
| LMI-2 | Improved Methodologies for Estimating Development Costs |
| LMI-3 | Applying Advanced Tools for Analysis of Program Management |
| LMI-4 | Enhancing Resource Analysis |
| LMI-5 | Weapon System Total Life Cycle Costs: A Management-Oriented Cost Accounting System |
| LMI-6 | Metrics for Business Area Programming |

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| LMI-7 | Understanding the Costs of Logistic Support and Interoperability for NATO Enlargement |
| LMI-8 | Improving DBOF Pricing |
| LMI-9 | Analysis of Institutional Training Resources |
| LMI-10 | Accrual Accounting for Post-Retirement Military Health Care |

Institute for Defense Analyses

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|--------|---|
| IDA-1 | Defense Resource Management Cost Model |
| IDA-2 | FYDP Tracking and Analysis System |
| IDA-3 | FYDP Related Studies |
| IDA-4 | Defense Programming Database |
| IDA-5 | Science and Technology Models |
| IDA-6 | Contingency Operations Support Tool (COST) |
| IDA-7 | Trends in Weapons System O&S Costs |
| IDA-8 | Operations and Maintenance (O&M) Funding Migration |
| IDA-9 | Assessing Defense Funding Supporting Readiness |
| IDA-10 | Force Modernization Metrics |
| IDA-11 | Non-major Procurement Funding |
| IDA-12 | Program Objective Memorandum (POM) Major Defense Acquisition Program (MDAP) Reporting |
| IDA-13 | Force Aging |
| IDA-14 | USMC Utility Rotary Wing Aircraft |
| IDA-15 | Rotary Wing Aircraft Recapitalization Analyses |
| IDA-16 | DoD Helicopter Commonality Study |
| IDA-17 | Space and Missiles Systems Nuclear Hardening Costs |
| IDA-18 | Cost of Stealth |
| IDA-19 | Affordable Multi-Missile Manufacturing (AM3) |
| IDA-20 | Technical and Schedule Risk Assessments for Tactical Aircraft Programs |
| IDA-21 | Methods to Assess Schedules for the Strategic Defense System |
| IDA-22 | Resource Analysis for Test and Evaluation |
| IDA-23 | Program Risk Analysis and Management |
| IDA-24 | Evaluation of TRICARE Program Costs |
| IDA-25 | Financial Databases of Defense Manufacturers |
| IDA-26 | Economic Drivers of Defense Overhead Costs |
| IDA-27 | DSAMS Cost Estimating |
| IDA-28 | Active/Reserve Integration |
| IDA-29 | Reducing Defense Infrastructure Costs |
| IDA-30 | Environmental Costs, Unexploded Ordnance Remediation |
| IDA-31 | Defense Economic Planning and Projection Systems (DEPPS) |
| IDA-32 | Coast Guard Models |
| IDA-33 | Cost Analysis Education |

**OFFICE OF THE DIRECTOR,
PROGRAM ANALYSIS AND EVALUATION**

| | | |
|------------------------|---|-------------|
| <i>Name</i> | Office of the Deputy Director (Resource Analysis) Program Analysis and Evaluation | |
| <i>Address</i> | OSD(PA&E) 1800 Defense Pentagon Washington, DC 20301-1800 | |
| <i>Director</i> | Dr. David L. McNicol, (703) 695-0721 | |
| <i>Size</i> | Professional: | 36 |
| | Support: | 5 |
| | Consultants: | 1 |
| | Subcontractors: | 17 |
| <i>Focus</i> | Cost Analysis Improvement Group (CAIG); Life-Cycle Costs of Major Defense Acquisition Programs; Force Structure; Operating and Support Costs; Economic Analysis | |
| <i>Activity</i> | CAIG reviews and studies per year: | 30-40 |
| | POM, budget, FYDP reviews: | As required |

PA&E-1

Title: Force and Support Cost (FSC) System

Summary: DoD needs a quick and accurate cost estimating tool for proposed changes in forces and support infrastructure. OSD(PA&E) must supply rapid, credible, and incisive evaluations of the likely budget effects of major force and infrastructure alternatives in support of the program/budget review process. This project designs and implements an analysis system to address these fundamental issues.

Classification: Unclassified

Sponsor: OSD(PA&E)
FICAD
The Pentagon, Room 2D278
Washington, DC 20301
Donald Tison, (703) 697-4311

Performer: RAND

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|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 96 | \$375,000 | |
| | 97 | \$550,000 | |
| | 98 | \$550,000 | |

Schedule: Start End
Ongoing

Data Base:

Publications: TBD

Category: II.C

Keywords: Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

PA&E-2

Title: Force and Support Cost (FSC) System and FYDP Support—VGS

Summary: This project is the O&M adjunct to the RDT&E funded research and development effort (see PA&E-1). The O&M funding provides software maintenance of portions previously developed. FSC must be imported from Ingres to ORACLE and from Excel 4.0 macro language to Excel Visual Basic. This effort also provides critical client software support through Microsoft Office applications such as the electronic FYDP book.

Classification: Unclassified

Sponsor: OSD(PA&E)
FICAD
The Pentagon, Room 2D278
Washington, DC 20301
Donald Tison, (703) 697-4311

Performer: RAND

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 96 | \$170,000 | |
| | 97 | \$200,000 | |
| | 98 | \$200,000 | |

Schedule: Start End
 Ongoing

Data Base:

Publications: TBD

Category: II.C

Keywords: Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

PA&E-3

Title: Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems

Summary: Follow-on to CIM-funded Functional Process Improvement (FPI) project for VAMOSC. The FY 1997 data standardization/identification effort will be based on lessons learned from the FY 1996 VAMOSC Business Process Review (BPR) and will lay a foundation for the prototype development of the standard "To Be" VAMOSC system.

Classification: Unclassified

Sponsor: OSD(PA&E)
 FICAD
 The Pentagon, Room 2D278
 Washington, DC 20301
 Donald Tison, (703) 697-4311

Performer: Andrulis

Resources: FY Dollars Staff-years
 96 \$275,000
 97 \$150,000
 98 \$250,000

Schedule: Start End
 Ongoing

Data Base:

Publications:

Category: II.A.2

Keywords: Government, Estimating, Reviewing/Monitoring, Programming, Forces, Facilities, Overhead/Indirect

PA&E-4

Title: Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems

Summary: The objective of this effort is to maintain PA&E's VAMOSC capability. The contractor will support the VAMOSC/CIM working group and the Senior Level Steering Group, both of which comprise representatives from the CAIG, A&T, DUSD(L), CALS, DFAS, and the Services. The effort involves data modeling of Service VAMOSC databases, implementation of software that can read Service and DFAS data, update to Microsoft Access VAMOSC database application, and analysis of VAMOSC data for weapon systems

Classification: Unclassified

Sponsor: OSD(PA&E)
FICAD
The Pentagon, Room 2D278
Washington, DC 20301
Donald Tison, (703) 697-4311

Performer: Andrulis

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 96 | \$93,000 | |
| | 97 | \$260,000 | |
| | 98 | \$220,000 | |

Schedule: Start End
Ongoing

Data Base:

Publications:

Category: II.A.2

Keywords: Government, Estimating, Reviewing/Monitoring, Programming, Forces, Facilities, Overhead/Indirect

PA&E-5

Title: Improved Software Cost Reporting Processes for Weapon Systems

Summary: There is an urgent need to improve the reporting of actual costs incurred in the development of software for major defense acquisition programs for advanced weapon systems. These actual costs are the primary basis for the preparation of cost estimates for future weapon systems. However, there is currently no well-defined universal data that can be used to record the important aspects of a software task. Further, there is a need for a software cost model specific to OD (PA&E) requirements, which utilizes data about a software effort to predict its cost or schedule. This task will: (1) evaluate the minimum set of cost data that should be collected; and (2) develop a simplified, streamlined reporting format for use by all DoD program offices. This task will serve as a basis for a follow-on task to calibrate or develop software cost models that utilize the collected data.

Classification: Unclassified

Sponsor: OSD(PA&E)
The Pentagon, Rm. 2D300
Washington, DC 20301
Dr. Vance Gordon, (703) 697-2999

Performer: Dr. Thomas Frazier, (703) 845-2132
Dr. John Bailey, (703) 845-2132

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 98 | \$200,000 | 1.25 |

Schedule: Start End
Sep 97 Jan 99

Data Base:

Publications: TBA

Category: II.C

Keywords: Government, Estimating, Production, Software, Study

PA&E-6

Title: Selected Acquisition Report (SAR) Cost Variance Analysis

Summary: The project will provide insight into the magnitude and sources of major defense acquisition program (MDAP) cost growth. The project will quantify the amount of MDAP cost growth that is attributable to policy decisions as well as the amount attributable to errors on the part of the acquisition community as a whole. The principal investigators will transfer historical cost data, cost variance data, and explanatory notes contained in SARs to an electronic spreadsheet. In addition, to recording the SAR taxonomy of cost variances, the principal investigators will classify historical cost variances according to a new taxonomy, which will be provided by the project sponsor.

Classification: Unclassified

Sponsor: OSD(PA&E)
PFED
The Pentagon, Room 2D322
Washington, DC 20301
Jermone E. Pannullo, (703) 693-7828

Performer: RAND

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | \$65,000 | |
| 97 | \$65,000 | |
| 98 | \$165,000 | |

Schedule: Start End
Ongoing

Data Base:

Publications:

Category: II.C

Keywords: Industry, Government, Estimating, Weapon Systems, Review, Study

PA&E-7

Title: Demilitarization and Disposal Costs of Tactical Aircraft

Summary: The project will build analysis tools for estimating the costs of demilitarization and disposal for tactical aircraft. This task is a natural complement to two similar studies, one recently completed for large aircraft (bombers and transports) and another still in progress for tactical missiles.

Classification: Unclassified

Sponsor: OSD(PA&E) with the cooperation of the three Service Cost Agencies
OAPPD
The Pentagon, Room 2D278
Washington, DC 20301
Richard P. Burke, (703) 697-5056

Performer: TBD

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| FY 97 | | FY 98 |

Schedule: Start End

Data Base:

Publications:

Category: I.D

Keywords: Government, Analysis, Retirement and Demilitarization, Risk/Uncertainty, Data Collection, Data Base, Study

PA&E-8

Title: Developing Cost Estimating Relationships for the Streamlined Manufacturing Environment

Summary: The objective of this task is to examine specific acquisition reform measures that have been proposed and to develop methodologies for predicting quantitatively the effects on RDT&E and procurement costs of acquisition reform and manufacturing streamlining.

Classification: Unclassified (Proprietary Information)

Sponsor: OSD(PA&E)

OAPPD

The Pentagon, Room 2D-278

Washington, DC 20301

Richard P. Burke, (703) 697-5056

Performer: IDA

Dr. Karen W. Tyson, (703) 845-2572

Dr. J. R. Nelson, (703) 845-2571

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | | \$200,000 | 1.3 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Mar 96 | Jun 98 |

Data Base: None

Publications: TBD

Category: I.B

Keywords: Industry, Estimating, Production, Acquisition Strategy, Automation, Advanced Technology, Case Study, Review

PA&E-9

Title: IDA Cost Research Symposium

Summary: IDA conducts a cost research symposium to facilitate the exchange of information on cost research that is in progress and planned, thereby avoiding wasteful duplication of effort and providing for more informed research planning decisions by participating offices. The Chairman, OSD CAIG, cosponsors this symposium. The 1998 Symposium will focus on the status of the DoD's capabilities to estimate the costs of future weapon systems and integration of this information into the DoD Six-Year Cost Research Plan. Documentation of the symposium includes a catalog of cost research projects recently completed or still in progress at participating offices.

Classification: Unclassified

Sponsor: IDA Central Research Program

OD(PA&E)

Performer: IDA

Dr. Stephen J. Balut, (703) 845-2527

Resources: FY Dollars Staff-years
\$45,000 0.3

Schedule: Start End
Oct 97 Sep 98

Data Base: **Title:** DoD Cost Research Projects
Description: Summary descriptions of cost research projects (an example is this description)
Automation: On the web in Acrobat Reader.

Publications: *The 1998 IDA Cost Research Symposium*, Stephen J. Balut, Document D-2173, Unclassified, August 1998.

Category: II.A.1

Keywords: Government, Reviewing/Monitoring, Forces, Weapon Systems, Life Cycle, Data Collection, Data Base

PA&E-10

Title: Cost Analysis of Advanced Materials

Summary: Advanced materials are increasingly being used in new weapon systems. The limited cost history and difficulty in identifying the cost drivers and risks for new materials and processes complicate estimating the costs of systems incorporating these materials. This project will develop an advanced materials/processes primer to aid analysts in cost estimates. The materials examined will include ceramics, metal matrix composites, ceramic matrix composites, intermetallic materials, and superalloys. In addition, PA&E cost knowledge of organic matrix composites will be updated to reflect technologies developed since the studies in 1991.

Classification: Unclassified

Sponsor: OSD(PA&E)
WSCAD
The Pentagon, Room 2C310
Washington, DC 20301
Mr. Gary Bliss (703) 697-7282

Performer: RAND

Resources: FY Dollars Staff-years
98 \$200,000

Schedule: Start End
Oct 96 Ongoing

Data Base:

Publications:

Category: I.C.1

Keywords: Government, Analysis, Weapon Systems, EMD, Production, Demonstration/Validation, Labor, Material, Schedule, Study

PA&E-11

Title: Cost of Developing and Producing Next Generation Tactical Aircraft

Summary: Over the next five years, DoD will be making funding decisions for tactical aircraft development and production, amounting to over \$350 billion. CAIG is responsible for preparing independent cost estimates for these aircraft for cost certification to Congress. The existing tools do not address the cost of the new generation fighter aircraft. Design attributes of the next generation of tactical aircraft are not accommodated in existing cost estimating tools. Important attributes include low observable, advanced materials (both composites and metals), integrated avionics, and unique propulsion designs. These attributes are all evident in the F-22 and Joint Strike Fighter (JSF) programs. An urgent need exists to develop the necessary cost estimating tools to support these and future tactical aircraft programs. The objective is to collect, analyze, and exploit the latest available information to develop databases and methods for estimating the development and production costs of the next generation tactical aircraft.

Classification: Unclassified

Sponsor: OSD(PA&E)
WSCAD
The Pentagon, Room 2C-310
Washington, DC 20301
Gary Pennett, (703) 697-7282

Performer: IDA
Mr. Bruce Harmon, (703) 845-2501

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$250,000 | |
| 98 | \$200,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct 96 | Sep 98 |

Data Base:

Title:

Description: Cost and other data on contemporary aircraft programs, including F-117, B-2, YF/F-22, YF-23, F/A-18E/F, V-22, C-17

Automation: TBD

Publications:

Categories: I.C.1, II.A.2

Keywords: Government, Estimating, Analysis, Aircraft, EMD, Material, Demonstration/Validation, Engineering

PA&E-12

Title: Contractor Cost Data Reporting (CCDR) Clearinghouse/Repository

Summary: The DoD develops cost estimates of major weapon systems using historical data, the primary sources of which are the Contractor Cost Data Reports (CCDRs) provided by hundreds of defense contractors. CCDR data requirements have not been revised substantially since the system was established nearly two decades ago. In annual meetings at IDA on cost research, the directors of the major DoD organizations that do defense cost research noted that the CCDR system had not been meeting their needs. Since then, steps have been taken to improve the usefulness of the CCDR system, to include analysis and

reengineering of the system. This effort addresses additional steps that will further improve the utility of the CCDR system. This includes preparation of the CCDR Handbook that is consistent with established CCDR policies, DoD cost estimating requirements, and contractor capabilities. The study will also evaluate the existing CCDR report formats and make appropriate recommendations to re-design or replace the forms. In this regard, IDA will review and evaluate the availability of DCAA provided data to satisfy overhead cost estimating needs. This task will also address the potential for developing and implementing a system to collect data directly from the contractor's accounting system and convert or map the data into the standard CCDR report formats.

Classification: Unclassified

Sponsor: OD(PA&E), WSCAD
The Pentagon, Rm. 2C310
Washington, DC 20301
Thomas J. Coonce, (703) 695-7282

Performer: To Be Determined

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$150,000 | |
| | 98 | \$220,000 | |
| | 99 | \$75,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 96 | Sep 99 |

Data Base:

Publications:

Category: II.A.2

Keywords: Government, Industry, Analysis, Labor, Material, Schedule, Study

PA&E-13

Title: CAIG Information Center Support

Summary: The purpose of this task is to purchase equipment and software for establishing the CAIG Information Center. The immediate objective is to establish a central catalog of existing holdings, including technical reports, CAIG case files, and PPBS documents.

Classification: Unclassified

Sponsor: OSD(PA&E)
Resource Analysis
The Pentagon, Room 2D278
Washington, DC 20301
Libbie Blaeuer, (703) 697-0221

Performer:

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$50,000 | |
| | 98 | \$50,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 96 | Sep 98 |

Database:

Publications:

Category: II.A

Keywords: Government, Industry, Data Collection, Data Base

PA&E-14

Title: Improved Methodology for Projection of Development Costs

Summary: The purposes of this task are to develop a better understanding of the factors that drive development costs for DoD systems, and to devise an improved methodology for projecting those costs.

Classification: Unclassified

Sponsor: OSD(PA&E)
Resource Analysis
The Pentagon, Room 2D278
Washington, DC 20301
Steve Miller, (703) 697-0317

Performer: LMI

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 98 | \$200,000 | |
| | 99 | \$50,000 | |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Oct 96 | Sep 98 |

Database:

Publications:

Category: I.C

Keywords: Government, Industry, Weapon Systems, Demonstration/Validation, EMD, Risk/Uncertainty, Data Collection, Data Base, Expert System.

BALLISTIC MISSILE DEFENSE ORGANIZATION

| | | | |
|-----------------|---|------------------------------------|----|
| Name | Ballistic Missile Defense Organization | | |
| Address | Crystal Square Two, Suite 809 1725 Jefferson Davis Highway Arlington, VA 22202 | | |
| Director | Donna M. Snead, (703) 604-3584 | | |
| Size | Professional: | | 7 |
| | Support: | | — |
| | Consultants: | | 36 |
| | Subcontractors: | | — |
| Focus | BMDO Cost Policy, Cost Estimating, Cost Analysis, Cost Research/Methodology Improvement | | |
| Activity | Number of projects in progress: | 6 Cost Research/Method Improvement | |
| | Average duration of project: | 4 months | |
| | Average number of staff members assigned to a project: | 2 | |
| | Average number of staff-years expended per project: | 1+ | |
| | Percentage of effort conducted by consultants: | 85% | |

BMD0-1

Title: Automated CER Data Base

Summary: This effort will establish a relational data base of cost estimating relationships (CERs) which are available for use in BMDO Independent Cost Assessments. At this time we envision that the data base will consist of four tables which contain (1) CERs and their fit statistics; (2) variables and their properties (units, ranges, etc.); (3) the CERs' coefficients and their statistics; and (4) a description of the source documentation.

Classification: Unclassified

Sponsor: Ballistic Missile Defense Organization (BMDO)
BMDO/POE
Crystal Square Two, Suite 1200
1725 Jefferson Davis Highway
Arlington, VA 22202
Donna M. Snead, (703) 604-3584

Performer: MCR, Inc.
1111 Jefferson Davis Highway, Suite 601
Arlington, VA 22202
Vernon Reisenleiter, Tom Gilbride, (703) 416-9500

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | | 1.2 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Jan 98 | Sep 98 |

Data Base:

Title:

Description: The structure of the data base was described under summary

Automation: Microsoft Access

Publications: TBD

Category: II.A.2

Keywords: Weapon Systems, Estimating, Data Base

BMD0-2

| | |
|------------------------|--|
| Title: | BMDO Operating & Support Cost Estimating |
| Summary: | Use of Operating & Support (O&S) cost estimates in the acquisition review and decision process is becoming more prevalent. The desire to maximize the return on budgeted acquisition dollars, reduced operating and maintenance budgets, and the need to trade off capabilities to reduce costs, mean more information on the cost to field a system is necessary. Also, with multiple programs in the early to mid-development stages, when O&S trades are of most benefit, the BMDO has found that O&S considerations are of growing importance to their systems decision analysis processes. Concurrently, it was noted that there is no common system of systems approach to O&S costing across these programs. Definition of the O&S period, ground rules for application of O&S costs, system life span, and rules for apportionment of O&S across multiple systems are among the issues which need to be addressed for future BMDO O&S estimates. |
| Classification: | Unclassified |

| | | | |
|----------------------|---|----------------|--------------------|
| Sponsor: | Ballistic Missile Defense Organization (BMDO) BMDO/POE Crystal Square Two, Suite 1200 1725 Jefferson Davis Highway Arlington VA 22202 Donna M. Snead, (703) 604-3584 | | |
| Performer: | MCR, Inc. 1111 Jefferson Davis Highway, Suite 601 Arlington VA 22202 Joe Wagner, (703) 416-9500 | | |
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | | 0.1 |
| Schedule: | <u>Start</u> | <u>End</u> | |
| | Feb 98 | Sep 98 | |
| Data Base: | N/A | | |
| Publications: | BMDO Operating & Support Cost Estimating Guide, pending | | |
| Category: | II.A.2 | | |
| Keywords: | Government, Industry, Estimating, Operations and Support, Life Cycle, Weapon Systems | | |

BMDO-3

Title: BMDO Cost Risk Research

Summary: The Ballistic Missile Defense Organization requires accurate risk estimation for budget preparation. A variety of risk research topics will be studied for continued enhancement of the BMDO cost risk model (last updated October 1997). The BMDO Cost Risk Working Group will meet about quarterly to review and discuss the progress and results of the research. Topics include: Study of EVM Data to provide insights into time distribution of cost growth; Procedures for promulgation of risk results to Program Offices; Risk in O&S; Cost Risk for the NMD System of Systems; Modeling mid-phase risk assessments; Assessment of Schedule/Technical Risk Criteria and Weighting Schemes; Study of Cost Estimating Risk; Study of Hardware-to-Below-the-Line cost growth correlation; Study of COTS/NDI effect on Cost Growth; Effect of the "Ping Factor" on Cost Estimates; Revisit of the effect of Cost Analyst Confidence Scores; Coefficient of Variation as a QA Metric; Software Cost Growth; Re-visit of Schedule/Technical Mapping Equations.

Classification: Unclassified

Sponsor: Ballistic Missile Defense Organization (BMDO)
BMDO/POE
Crystal Square Two, Suite 1200
1725 Jefferson Davis Highway
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Donna M. Snead, (703) 604-3584

Performer: MCR, Inc.
1111 Jefferson Davis Highway, Suite 601
Arlington VA 22202
Vernon Reisenleiter, (703) 416-9500

Dick Coleman, (703) 834-5000; Jessica Ayers, (703) 416-9500

| | | | |
|----------------------|--|----------------------|---------------------------|
| Resources: | <u>FY</u> 98 | <u>Dollars</u> | <u>Staff-years</u> 1.3 |
| Schedule: | <u>Start</u> Apr 98 | <u>End</u> Dec 98 | |
| Data Base: | <u>Title:</u> <u>Description:</u> Databases will consist of historical SARs and CPRs <u>Automation:</u> Microsoft Excel and Crystal Ball | | |
| Publications: | <i>Cost Risk Analysis of the Ballistic Missile Defense (BMD) System, Revision 3</i> , completed October 1997 | | |
| Category: | II.A.2 | | |
| Keywords: | Government, Estimating, Weapon Systems, Life Cycle, Risk/Uncertainty, Mathematical Modeling, Computer Model | | |

Title: Cost Drivers Analysis

Summary: BMDO is establishing a technology road map and prioritizing its technology development programs. This research effort supports that objective. It is being done in conjunction with a working group whose membership is responsible for technology development, acquisition, and cost estimating. The purpose of this effort is to provide insights into: the hardware items, the software products, and the support activities; and the technical and performance CER variables that drive the life cycle costs of BMDO's Major Defense Acquisition Programs (MDAPs). A long term product of this effort will be the accumulation of databases, cost estimating relationships, and modeling approaches for estimating the life cycle cost impacts of advanced technology applications to missile defense systems. In the first phase of Cost Drivers Analysis, BMDO/POE examined its Independent Cost Assessments to identify the high cost items at the fourth and lower levels of the cost breakdown structures and to identify cost driving items common across the MDAPs. BMDO/POE also examined the sensitivity of MDAP cost estimates to variation in the independent variables of the BMDO ICA CERs. At the CER level the analysis revealed a number of cost driving technical and performance characteristics, such as fabrication yield and integrated chip count as drivers of focal plane array (FPA) production costs. At the MDAP level the analysis determined the first order impacts of the same technical and performance subsystem life cycle costs - such as FPA yield on the life cycle cost of the THAAD IR seeker. Continuing Cost Drivers Analysis research is focusing on refining the earlier results and conducting detailed cost impact assessments of technology insertions into BMDO MDAPs. This project includes service participation.

Sponsor: Ballistic Missile Defense Organization (BMDO)
BMDO/POE
Crystal Square Two, Suite 1200
1725 Jefferson Davis Highway
Arlington, VA 22202
Donna M. Snead, (703) 604-3584; William Seeman, (703) 604-0364

| | | | |
|----------------------|---|----------------|--------------------|
| Performer: | MCR, Inc. 1111 Jefferson Davis Highway, Suite 601 Arlington VA 22202 Vernon Reisenleiter, (703) 416-9500 | | |
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | | 1 (FTE) |
| Schedule: | <u>Start</u> | <u>End</u> | |
| | Aug 97 | Indef | |
| Data Base: | <u>Title:</u> <u>Description:</u> Data base will consist of lists of cost drivers, critical parameters, and candidate cost improvement projects. <u>Automation:</u> Manual at this time | | |
| Publications: | TBD | | |
| Category: | II.A.2 | | |
| Keywords: | Weapon Systems, Life Cycle | | |

BMD0-5

| | | | |
|------------------------|---|----------------|--------------------|
| Title: | Fixed Site Early Warning Radars | | |
| Summary: | This type of radar has some unique programmatic features. These include turn-key contracts, mixing development and production activities (and funding) on the same contract, production in a factory environment with final integration and assembly at a remote site. A previous study (1984) to update CERs for ABM Radars did not appear to include systems with these programmatic characteristics. A more recent cost estimate (1988) for the BMEWs Site III upgrade did. However, the data base was small and also included data on mobile long-range surveillance Radars. A recent small scale study produced a factor for I&A and several BTL CERs. Jane's indicates that a number of BMEWs and PAVE-PAWS sites were upgraded in the late 1980s. The purpose of this research is to collect cost, technical, and programmatic data on these upgrades including support concepts and O&S experience. The purpose of this research is to improve BMDO estimates for GBR, XBR, and UEWR. | | |
| Classification: | Unclassified (proprietary), Classified supplement possible | | |
| Sponsor: | Ballistic Missile Defense Organization (BMDO) BMDO/POE Crystal Square Two, Suite 1200 1725 Jefferson Davis Highway Arlington, VA 22202 Donna M. Snead, (703) 604-3584 | | |
| Performer: | MCR, Inc. 1111 Jefferson Davis Highway, Suite 601 Arlington, VA 22202 Vernon Reisenleiter, (703) 416-9500 | | |
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | | 0.5 |
| Schedule: | <u>Start</u> | <u>End</u> | |
| | Mar 98 | Dec 98 | |

Data Base: **Title:**
Description: Database will consist of cost, programmatic and technical information
Automation: Microsoft Excel
Publications: Technical Report
Category: II.A.2
Keywords: Estimating, Government, Industry

BMDO-6

Title: Development CERs
Summary: Certain important CERs for the development phases require improvement. A set of CERs used by BMDO to estimate development engineering has a high standard error. Further it is desirable to use time as a predictor variable for both development engineering and development phase SEPM. In this project we will review some recent work for suitability to BMDO's needs. We will also expand existing data sets and develop new CERs.
Classification: Unclassified (Proprietary)
Sponsor: Ballistic Missile Defense Organization (BMDO)
 BMDO/POE
 Crystal Square Two, Suite 1200
 1725 Jefferson Davis Highway
 Arlington, VA 22202
 Donna M. Snead, (703) 604-3584
Performer: MCR, Inc.
 1111 Jefferson Davis Highway, Suite 601
 Arlington, VA 22202
 Vernon Reisenleiter, (703) 416-9500
Resources: FY Dollars Staff-years
 98 TBD
Schedule: Start End
 Jul 98 TBD
Data Base: **Title:**
Description: Data base will consist of development phase cost data, system technical data, and related programmatic information
Automation: Microsoft Excel
Publications: Technical Report
Category: II.A.2
Keywords: Engineering, CER, Weapon Systems

BMDO-7

Title: EMD Learning Slope and the Prototype to Production Step-Down Factor
Summary: An analysis of missile data conducted for NCCA in 199x simultaneously determined production and development phase learning curve slopes and a prototype to production step-down factor. The analysis was updated for NAVAIR 199y. The purpose of this study is to conduct similar analysis for Radar systems.

Classification: Unclassified

Sponsor: Ballistic Missile Defense Organization (BMDO)
 BMDO/POE
 Crystal Square Two, Suite 1200
 1725 Jefferson Davis Highway
 Arlington, VA 22202
 Donna M. Snead, (703) 604-3584

Performer: MCR, Inc.
 1111 Jefferson Davis Highway, Suite 601
 Arlington, VA 22202
 Vernon Reisenleiter, (703) 416-9500

Resources: FY Dollars Staff-years
 99 TBD

Schedule: Start End
 TBD TBD

Data Base: Title:
Description: Development and production cost data and quantities for electronics systems
Automation: Microsoft Excel

Publications: TBD

Category: II.A.2

Keywords: Estimating, Electronics/Avionics, EMD, Cost Progress Curve

ARMY COST AND ECONOMIC ANALYSIS CENTER

| | | |
|-----------------|---|-------------|
| Name | US Army Cost and Economic Analysis Center | |
| Address | 5611 Columbia Pike Falls Church, VA 22041-5050 | |
| Director | Robert W. Young; (703) 681-3217; DSN: 761-3217; FAX: (703) 681-8732 | |
| Size | Professional: | 56 |
| | Support: | 10 |
| | Consultants: | 0 |
| | Subcontractors: | 1 |
| Focus | <p>The focus of the Army's Centrally Funded Cost Research Program is to improve the capability of the Army to develop cost estimates and economic analysis. The main categories of concentration are:</p> <ul style="list-style-type: none"> Data Base Development Methodology Development Costing the Effects of New Technology Software Support Systems PPBES Linkages <p>The Commodity areas we cover are:</p> <ul style="list-style-type: none"> Aircraft Systems Missiles and Space Systems Wheel and Tracked Combat Vehicle Systems Communications and Electronics Systems General Systems/Future Technology/Tools and Models Information Management Systems Force Unit Costing Operating and Support Costing Financial Management and Operations | |
| Activity | Number of projects in process: | 15-20 |
| | Average duration of a project: | 9-12 months |
| | Average number of staff members assigned to a project: | 0.25 |
| | Average number of staff-years expended per project: | 2 |
| | Percentage of effort conducted by consultants: | 0% |
| | Percentage of effort conducted by contractors: | 90% |
| | Percentage of effort conducted by subcontractors: | 5% |

CEAC-1

Title: Update FORCES Cost Model, EFCDB, Cost Factor Handbook

Summary: Update the costs and factors in FORCES. Develop a deployment module that provides user with one source of input and output to estimate the cost to deploy army units in support of any type contingency to include documentation. The Forces and Organization Cost Estimating Systems (Forces) includes a Force Cost Model, Exportable Force Cost Database (EFCDB), Cost Factors Handbook, Military End Strength Reduction Model, and Civilian Manpower Reduction Model. The Cost Factor Handbook will be linked to ACEIT to improve cost analysts access to the data.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Management Analysis, Inc. (MAI)
Tully Anderson

Resources: FY Dollars Staff-years
97 \$380,000

Schedule: TBD

Data Base: The Exportable Force Cost Data Base

Publications:

Category: II.A.1

Keywords: Government, Estimating, Analysis, Forces

CEAC-2

Title: Crosswalk ISR Cost Factors into FORCES Cost Model

Summary: Expand and improve the cost estimating capabilities of FORCES by incorporating the Installation Status Report (ISR) new construction and sustainment factors into it. USACEAC has validated new construction and sustainment cost factors for the ISR that have proven to be very accurate in predicting cost requirements for the Army. This project will take full advantage of the financial data linkages which have been completed through AMSCO redesign efforts and linkage to DFAS 218 report by developing and incorporating cost factors into a format usable in FORCES.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Management Analysis, Inc. (MAI)
Tully Anderson

Resources: FY Dollars Staff-years
97 \$125,000

Schedule: TBD

Data Base: The Exportable Force Cost Data Base

Publications:

Category: II.A.1

Keywords: Government, Estimating, Analysis, Forces

CEAC-3

Title: FORCES Deployment Cost Model

Summary: Update the cost factors used in the Army Deployment Cost Model. The current FORCES model provides cost information on the activation, annual operations, inactivation and movement of Army TO&E force units and requires considerable adjustments to be made by cost analysts when estimating deployment of forces in support of a contingency operation. The Army Deployment Cost Model will be a stand alone self contained model which will allow Army Budget, PA&E and other cost analysts to derive accurate planning costs for the development of army units into a Theater of Operations.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Management Analysis, Inc. (MAI)
Tully Anderson

Resources: FY Dollars Staff-years
97 \$215,000

Schedule: TBD

Data Base: The Exportable Force Cost Data Base

Publications:

Category: II.A.1

Keywords: Government, Estimating, Analysis, Forces

CEAC-4

Title: Installation Status Report (ISR) Part 1, (Infrastructure) Revision and Update

Summary: ISR maintains the current condition assessment that incorporates and validates installation infrastructure standards. ISR I cost factors are developed by Facility Category Group (FCG) for Sustainment, New Construction, and Renovation. The revised, current cost factors in ISR are for CONUS/OCONUS installations. The update includes factors and refined methodologies for CONUS/OCONUS, Reserve, National Guard Bureau, and Medical facilities, and the sustainment and renovation factors of all historical facilities.

Classification: Unclassified

Sponsor: U S Army Cost and Economic Analysis Center

Performer: Management Analysis, Inc. (MAI)

Resources: FY Dollars Staff-years
97 \$100,000

Schedule: Start End
Sep 97 Mar 98

Data Base:

Publications:

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Infrastructure, Operations and Support

CEAC-5

Title: The Army Manpower Cost System (AMCOS)

Summary: The Army Manpower Cost System (AMCOS) is a family of active, reserve, and civilian manpower models developed to improve the accuracy and flexibility of manpower cost estimation. USACEAC has responsibility for operating, maintaining, updating and modifying the AMCOS model, which is used to provide manpower cost estimates. This effort will develop a Windows based database for AMCOS with a new user interface and consolidate six AMCOS databases into a single database.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: SRA

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$141,000 | |

Schedule: TBD

Data Base:

Publications:

Category: II.A.2

Keywords: Government, Estimating, Analysis, Forces, Data Collection, Manpower/Personnel

CEAC-6

Title: ACEIT/ACDB

Summary: This project funds the Army portion of a joint effort of the US Army Cost and Economic Analysis Center and the Air Force Electronic Systems Center and Air Force Cost Analysis Agency to meet the Army Cost Estimation Support Requirements. This funds dial up support for technical assistance when required for Army Cost Analysts and support contractors. It includes the update of annual Inflation Indices, problem resolution, bug fixes and configuration control for Army Acquisition Information/Databases. This contract acts as the Super Database Administrator (DBA) for USACEAC commodity contractors' DBAs.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center
Richard Bishop, (703) 681-9124; DSN: 761-9124

Performer: Tecolote Research, Inc.
Tom Kielpinski

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$150,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Apr 98 | May 99 |

Data Base: IBM PC Compatible
Publications: Tecolote ACE-IT Users Guide
Categories: II.A.1, II.A.2
Keywords: Government, Weapon Systems, Data Base

CEAC-7

Title: Communications and Electronics Cost Data Base/Methodology
Summary: This project will develop a Communications and Electronics Database. This effort will add additional Army communications-electronics systems to the database; expand the electronics Work Breakdown Structure to include active RF assemblies, analog electronics and power supplies; update existing CERs. Including Investigation of future alternatives for wireless network connectivity; develop useful factors and investigate potential models supporting this new capability.
Classification: Unclassified
Sponsor: US Army Cost and Economic Analysis Center
Performer: Technomics, Inc.
John Horak
Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$125,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Sep 97 | Sep 98 |

Data Base: ACDB
Publications: *Communications And Electronics Cost Model*, TR-9607-01, October 1996
Categories: I.C.2, II.A.2, II.B, II.C
Keywords: Government, Estimating, Analysis, WBS, Data Base, CER, Data Collection

CEAC-8

Title: Operating and Support Management Information System (OSMIS) Data Base Management
Summary: OSMIS is a Management Information System designed to assist the Army in determining the historical operating and support costs of selected major fielded weapons systems through the production of cost data and cost factors based on actual usage data. The cost data generated from OSMIS is derived from existing Army Logistics Support Management Information Systems. Develop annual data collection process; collect data from LIF, PMR, ULLS and other sources. Construct annual Materiel Systems Definition by system/Line Item Number. Generate and validate Weapon system to ammunition crosswalk tables, Unit tables and system asset tables, Cost Tables and OSMIS Cost Tables. Perform system maintenance and develop system documentation.
Classification: Unclassified
Sponsor: US Army Cost and Economic Analysis Center
Terry Mateer, (703) 681-3335; DSN: 761-3335

Performer: CALIBRE Systems, Inc.
Bernard Bean

Resources: FY Dollars Staff-years
97 \$799,000

Schedule: Start End
Nov 97 Nov 98

Data Base: OSMIS

Publications: U.S Army Operating and Support Management Information System (OSMIS) Manuals (FY97); Reference Table Maintenance Manual; Program Maintenance Manual; OSMIS Operations Manual.

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Budgeting, Weapon Systems, Operations and Support, Data Base

CEAC-9

Title: Operating and Support Management Information System (OSMIS) Output Products

Summary: OSMIS is a Management Information System designed to assist the Army in determining the historical operating and support costs of selected major fielded weapons systems through the production of cost data and cost factors based on actual usage data. The cost data generated from OSMIS is derived from existing Army Logistics Support Management Information Systems. This contract develops O&S Cost Factors for the POM, BES and President's Budget, Aircraft reimbursement rates, Class II & IV Cost Factors and an Annual Report in various formats. The OSMIS processed data is used in other systems and models such as FORCES, REVOLVER, and the OSD VAMOSC System Interface Model. OSMIS also contains information on consumables, depot level reparable (DLRs), training ammunition, OPTempo, densities, depot maintenance, and petroleum, oil and lubricants (POL).

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center
Terry Mateer, (703) 681-3335; DSN: 761-3335

Performer: CALIBRE Systems, Inc.
Bernard Bean

Resources: FY Dollars Staff-years
97 \$390,000

Schedule: Start End
Nov 97 Nov 98

Data Base: OSMIS

Publications: "U.S Army Operating and Support Management Information System (OSMIS)/ Visibility and Maintenance of Operating and Support Cost (VAMOSC) Annual Report (FY97)," 27 Oct 1997.

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Budgeting, Weapon Systems, Operations and Support, Data Base

CEAC-10

Title: Operating and Support Management Information System (OSMIS) Special Studies

Summary: OSMIS is a Management Information System designed to assist the Army in determining the historical operating and support costs of selected major fielded weapons systems through the production of cost data and cost factors based on actual usage data. The cost data generated from OSMIS is derived from existing Army Logistics Support Management Information Systems. This effort will develop a relational database to increase the users access to the database and to decrease the query turn-around time dramatically. Other special studies include: Increase OSMIS database coverage for Contractor Logistics Support; Integrated Sustainment Maintenance; IMPAC purchases; and warranty demands. Create OCIE market basket to support PPBES, Investigate sources for PDSS information. Coordinate Master System Definitions with system PMOs for validation and verification. Investigate ULLS-G for additional useful data, Incorporate Army Modernization Reference Data into OSMIS database. Develop procedure for tracking Training Resource Model projections with historical OSMIS data. Investigate LIF/CDBB as sources of data and recommend necessary fixes/changes to improve databases. Support Prime Vendor Support (PVS) projects such as AH-64A, M109A6 etc. Develop methodology to account for age of the fleet tactical, combat vehicles and aircraft.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center
Terry Mateer, (703) 681-3335; DSN: 761-3335

Performer: CALIBRE Systems, Inc.
Bernard Bean

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$844,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Dec 97 | Dec 98 |

Data Base: OSMIS

Publications: TBD

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Budgeting, Weapon Systems, Operations and Support, Data Base

CEAC-11

Title: Aircraft Module Data Base Migration and Methodology Enhancement

Summary: This project will provide products to improve the capability of the Aircraft Cost Analyst to develop accurate cost estimates as high technology products and processes increase in Aircraft systems. This project includes the completion of the Aircraft Module conversion

activities and the fielding of the Aircraft Module in the Automated Cost Database (ACDB) to USACEAC, PEO-AVIATION and AMCOM.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Science Applications International Corporation (SAIC)
Paul Popovich

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$125,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Apr 97 | Jun 98 |

Data Base: Automated Cost Data Base (ACDB)

Publications:

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Aircraft, Electronics/Avionics, Data Base, Data Collection

CEAC-12

Title: Missile Module of ACDB

Summary: USACEAC has developed a standard architecture for the acquisition of Weapon and Information Management systems. The primary objective of this project is to identify and collect missile cost data from CDRs, CPRs, contracts or other sources which can be mapped and normalized to populate the Missile Module of the USACEAC data base. Data from other DOD agencies are of particular interest if applicable to US Army Missile Systems. The database will be used to develop improved CERs, learning curves and cost factors. Results will be provided in USACEAC Space and Missile CER cost estimating library and distributed in ACEIT. The Missile module of ACDB will be fielded to USACEAC, PEO-TACTICAL MISSILES, SMDC and AMCOM.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Tecolote Research, Inc.

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$125,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Apr 98 | Apr 99 |

Data Base: Automated Cost Data Base (ACDB)

Publications:

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Missiles, Space Systems, Data Base, CER, CPR/CCDR, Data Collection

CEAC-13

Title: Wheel and Tracked Combat Vehicle Data Base and Methodology Development

Summary: This project will provide USACEAC support in the development of a Wheeled and Tracked Vehicle Module (WTVM) for the Automated Cost Database (ACDB), a component of the Army Cost Estimating Integrated Tool (ACEIT). Support will consist of data collection and analysis, data base evaluation and management, and the development of cost relationships using collected data. It also includes fielding the database to USACEAC, PEO-GROUND COMBAT & SUPPORT SYSTEMS, and TACOM. Performing special studies and analyses that further the state of the art of cost estimation of Wheeled and Tracked Vehicle Systems.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Science Applications International Corporation (SAIC) Len Ogborn

Resources: FY Dollars Staff-years
 98 \$125,000

Schedule: Start End

Data Base: Automated Cost Data Base (ACDB)

Publications:

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Land Vehicles, CER, CPR/CCDR, Data Collection, Data Base

CEAC-14

Title: Performance Affordability Assessment Model (PAAM)

Summary: Develop a cost model that captures, "Cost As an Independent Variable". Using the battlefield effectiveness model, Combined Arms Support Task Force Evaluation Model (CASTFOREM), provide linkage between the performance characteristics of systems or technologies that are played within the CASTFOREM model and their costs.

Classification: Unclassified

Sponsor: US Army Tank, Automotive and Armaments Command, US Army Cost and Economic Analysis Center
 Diane Hohn, (810) 574-8693; DSN: 786-8693

Performer: Science Applications International Corporation (SAIC)

Resources: FY Dollars Staff-years
 97 \$55,000 (in kind)

Schedule: TBD

Data Base:

Publications:

Categories: I.B.1, II.C

Keywords: Estimating, Analysis, CER, Data Base, Data Collection, Electronics/Avionics

CEAC-15

Title: Standard Service Costing (SSC)

Summary: This project will develop the methodology and databases for estimating the standard cost of services provided by Army Installations. This project will include an umbrella concept to implement SSC using Proof of Principle Plan, a mechanism to improve or develop SSC costing methodologies, and a case study for measuring performance and estimating costs of services. The methodologies developed will support ACSIM's Installation Status Report (ISR) Part III and AIM-HI Requirements Generator in connecting expected cost to output and outcome measures IAW GPRA.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Calibre Systems Inc.

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$125,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Aug 97 | Aug 98 |

Data Base:

Publications:

Category: II.A.1

Keywords: Government, Estimating, Analysis, Infrastructure, Facilities, Data Collection, Case Study

CEAC-16

Title: Leadership Training Materials for Activity Based Cost (ABC)

Summary: This project will develop the Army-wide ABC training capability needed, establish an Internet web home page and associated links to help train and administer the Army managerial costing policy. The project will develop a course and manual for installation and garrison commanders and project/service managers that imparts the concepts and knowledge of Managerial/Cost Accounting, ABC, Service Based Costing (SBC), and Standard Service Costing (SSC). Develop a Compact Disk (CD) Computer Based Training (CBT) course for managerial Costing. Develop an Internet CD CBT that can be run over the Internet. Both products should be designed to provide enhanced distance learning capability using audio and video features and be interactive with students.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Calibre Systems Inc.

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$89,500 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Sep 97 | Sep 98 |

Data Base:

Publications:

Category: II.A.1

Keywords: Government, Estimating, Analysis, Infrastructure, Facilities, Data Collection, Case Study

CEAC-17

Title: Standard Service Costing (SSC) FY98 Cost Factors

Summary: This project will develop expected cost factors based on approved SSC methodologies to support Army BASOPS requirement generation process at the MACXOM and Department of Army levels. Should cost factors will be based on qualitative and cost data collected during the ISR part III Beta test and the SBC data collected for FY's 95, 96 and 97.

Classification: Unclassified

Sponsor: U S Army Cost and Economic Analysis Policy

Performer: Calibre Systems Inc.

Resources: FY Dollars Staff-years
97 \$125,000

Schedule: Start End
Sep 97 Sep 98

Data Base: Title:
Description:
Automation:

Publications:

Category: II.A.2

Keywords: Government, Estimating, Analysis, Infrastructure, Facilities, Study

CEAC-18

Title: ACEIT Economic Analysis Applications

Summary: This project funds the development of an Economic Analysis Tool using ACEIT and the ACE Executive to facilitate new user's ability to quickly develop an economic analysis and enhance the implementation of CAIV functions in ACEIT.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center
Richard Bishop, (703) 681-9124; DSN: 761-9124

Performer: Tecolote Research, Inc.
Tom Kielpinski

Resources: FY Dollars Staff-years
97 \$90,000

Schedule: Start End
Apr 97 May 98

Data Base: IBM PC Compatible

Publications: Tecolote ACE-IT Users Guide

Categories: II.A.1, II.A.2
Keywords: Government, Weapon Systems, Data Base

CEAC-19

Title: ACEIT WIN Enhancements

Summary: This project funds the ACEIT WIN Enhancements and includes \$30K Air Force Cost Analysis Agency funding for ACE format, printing and documentation improvements. This includes improved flexibility for formatting and viewing reports, greater user control of column widths and row heights in tabular views and reports. New report formats will be provided such as a Variable Map, Calculation Trace-back and the inflation factors report. WIN ACE Enhancements, including improved support for team estimates, including support for multi-sheet workbooks; investigate feasibility for supporting "off-sheet" data references in ACE equations. Provide variable choice lists for appropriate columns, e.g., to show a list of variable names previously used for buy quantities, slope, fee, CERs, etc. This would enable a user to quickly find and re-use or not re-use previously used variables. Provide improved support for session and methodology navigation. For example, provide a capability to let the user highlight a variable used in an equation and bring up session information about that variable; allow for moving easily forward and backward through the logic chains in the estimate.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center
Richard Bishop, (703) 681-9124; DSN: 761-9124

Performer: Tecolote Research, Inc.
Tom Kielpinski

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$230,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Apr 97 | May 98 |

Data Base: IBM PC Compatible

Publications: ACE-IT Users Guide

Categories: II.A.1, II.A.2

Keywords: Government, Weapon Systems, Data Base

CEAC-20

Title: ACDB Enhancements

Summary: This project funds the update of the Database Administrator (DBA) and Database Entry (DBE) modules of the Automated Cost Database (ACDB) to be consistent with the ongoing ACDB Search and Retrieval (S&R) effort. The new S&R module will provide a modern, wizard-style, dialog driven interface to the existing databases. This will significantly improve the usability of the databases by cost analysts and estimators. This will provide resource data "autoloaders" similar to the existing technical data autoloader functions. This will also develop, implement, test and field a feature that provides the

DBE the ability to assign a single WBS cost line to multiple Cost Element Structures (CES), specifically allow non-recurring and recurring costs to be mapped to different CESs. This effort should develop standard CES mapping rules that would apply to many data bases (Standard Business Rules).

And also develop, implement, test, and field a feature that allows the use of Rich Text Format (RTF) in technical parameter and description fields. This will allow inclusion of conventional mathematical, engineering and scientific symbols without substitution of surrogate symbols.

Classification: Unclassified
Sponsor: US Army Cost and Economic Analysis Center
Richard Bishop, (703) 681-9124; DSN: 761-9124
Performer: Tecolote Research, Inc.
Tom Kielpinski
Resources: FY Dollars Staff-years
97 \$300,000
Schedule: Start End
Apr 97 May 98
Data Base: IBM PC Compatible
Publications: Tecolote ACE-IT Users Guide
Categories: II.A.1, II.A.2
Keywords: Government, Weapon Systems, Data Base

CEAC-21

Title: Development of Leadership Resources for Activity Based Costing (ABC)
Summary: This project will develop databases including one for an Army wide ABC effort tracking system, a dictionary of Army activities and related statistics, an Army Service Based Cost (SBC) dictionary linked to the ABC dictionary, and a separate database for tracking membership in the ABC Policy steering committee.
Classification: Unclassified
Sponsor: US Army Cost and Economic Analysis Center
Performer: Calibre Systems Inc.
Resources: FY Dollars Staff-years
97 \$155,000
Schedule: Start End
Sep 96 Sep 97
Data Base:
Publications:
Category: I.A
Keywords: Government, Estimating, Analysis, Budgeting

CEAC-22

Title: Link Activity Based Costs (ABC) to Service Based Costs (SBC)

Summary: This project will develop prototype linkage tracing Activity Based Costs to Service Based Costs at installations where ABC has been implemented. This task supports Army wide ABC capability needed to help train and administer the Army managerial costing policy. The linkage of ABC and SBC will support the VCSA requirement that ABC support higher HQ efforts such as SBC. Linking ABC and SBC efforts will reduce duplication of data collection, budget reconciliation, and cost validation.

Classification: Unclassified

Sponsor: U S Army Cost and Economic Analysis Policy

Performer: Calibre Systems Inc.

Resources: FY Dollars Staff-years
96 \$100,000

Schedule: Start End
Sep 96 Sep 97

Data Base:

Publications:

Categories: II.A.1, II.A.2

Keywords: Government, Infrastructure, Study

CEAC-23

Title: Aircraft Module Data Base Transition

Summary: This project will provide products to improve the capability of the Aircraft Cost Analyst to develop accurate cost estimates as high technology products and processes increase in Aircraft systems. This project includes the transition of the Aircraft Module Database in Automated Cost Database (ACDB) to a new contractor to perform the Army Aircraft DBA tasks.

Classification: Unclassified

Sponsor: US Army Cost and Economic Analysis Center

Performer: Ketron
Phil Wilson

Resources: FY Dollars Staff-years
97 \$125,000

Schedule: Start End
Apr 98 Apr 99

Data Base: Automated Cost Data Base (ACDB)

Publications:

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Aircraft, Electronics/Avionics, Data Base

ARMY MATERIEL COMMAND

| | | | |
|-----------------|---|--|---------|
| Name | U.S. Army Materiel Command, Cost Analysis Division | | |
| Address | U.S. Army Materiel Command, Cost Analysis Division 5001 Eisenhower Avenue Alexandria, VA 22333-0001 | | |
| Director | Ms. Maryann Dominiak, (703) 617-9100 | | |
| Size | Professional: | | 13 |
| | Support: | | 1 |
| | Consultants: | | 0 |
| | Subcontractors: | | 1 |
| Focus | | | |
| Activity | Number of projects in process: | | 1 |
| | Average duration of a project: | | 3 years |
| | Average number of staff members assigned to a project: | | 1 |
| | Average number of staff-years expended per project: | | 0.5 |
| | Percentage of effort conducted by consultants: | | 0% |
| | Percentage of effort conducted by subcontractors: | | 25% |

AMCRM-1

Title: ACE-IT Verification and Validation Tool

Summary: This project funds the development of a Verification and Validation Tool using ACE-IT and the ACE Executive to facilitate analysts' validation efforts. This tool will automatically access a set of 'decision rules' to evaluate ACE-IT output runs and quickly focus in on areas that need review. The application of artificial intelligence techniques such as knowledge based or expert systems and artificial neural networks will be evaluated for possible adoption.

Classification: Unclassified

Sponsor: HQ AMC

Mr. Rex Stone

Phone: (703) 617-9102; DSN: 767-9102

FAX: (703) 617-8425

Email: rstone@hqamc.army.mil

Information Management Support Center Funded

Performer: Tecolote Research Inc.

John McGahan

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 97 | \$45,000 OMA | |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Aug 97 | Mar 98 |

Data Base: IBM PC Compatible

Publications: Tecolote ACE-IT Users Guide

Categories: II.A.1, II.A.2

Keywords: Government, Analysis, Weapon Systems, Life Cycle, Statistics/Regression, Expert System

ARMY TANK-AUTOMOTIVE AND ARMAMENTS COMMAND

| | | |
|-----------------|--|------------|
| Name | Cost Analysis Division U.S. Army Tank-automotive and Armaments Command | |
| Address | AMSTA-RM-V Warren, MI 48397-5000 | |
| Director | Richard S. Bazzzy, (810) 574-6665; E-mail: bazzzyr@cc.tacom.army.mil | |
| Size | Professional: | — |
| | Support: | — |
| | Consultants: | — |
| | Subcontractors: | — |
| Focus | Responsible for the preparation of Program Office Estimates, Life Cycle Cost Estimates, and Economic Analyses. Perform cost validation to determine the reasonableness of cost estimates. Support the Earned Value Management Process. Develop cost models and data bases along with performing cost research. Support is provided to combat and combat support vehicle systems. | |
| Activity | Number of projects in process: | 15 |
| | Average duration of a project: | 3–20 weeks |
| | Average number of staff members assigned to a project: | 1–3 |
| | Percentage of effort conducted by consultants: | 0% |
| | Percentage of effort conducted by subcontractors: | 0% |

TACOM-1

Title: Performance Affordability Assessment Model (PAAM)

Summary: The objective of this modeling effort is to develop a cost model that will perform Cost as an Independent Variable (CAIV) trades utilizing not only cost, but also technical performance/effectiveness type information. Model will allow users to vary weapon system component level technical performance and see the resulting impact on system level cost and operational effectiveness.

Classification: Unclassified

Sponsor: US Army Tank-automotive and Armaments Command
AMSTA-RM-V
Richard Bazy, (810) 574-6665

Performer: US Army Tank-automotive and Armaments Command
AMSTA-RM-VC
Diane Hohn, (810) 574-8693; Lawrence Delaney

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| | \$326,000 | 4.5 |
| | (to date) | (to date) |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| May 94 | Sep 98 |

Data Base: None

Publications: None

Category: II.B

Keywords: Government, Estimating, Weapon Systems, Life Cycle, Advanced Technology, Cost/Production Function, Computer Model.

ARMY AVIATION AND MISSILE COMMAND

| | | | |
|-----------------|---|----|--|
| Name | U.S. Army Aviation and Missile Command Command Analysis Division | | |
| Address | AMSAM-CA Redstone Arsenal, AL 35898 | | |
| Director | Mr. Frank T. Lawrence, (256) 842-2817 | | |
| Size | Professional: | 78 | |
| | Support: | 9 | |
| | Consultants: | 0 | |
| | Subcontractors: | 1 | |
| Focus | Program Office Estimates, Cost studies, Economic analysis, Analytical studies, Cost Performance Report (CPR) analyses, Effectiveness analyses, Validation of cost studies | | |
| Activity | Provides analytical support to AMCOM functional organizations, PEO Aviation, PEO Tactical Missiles, and other tenant activities | | |

No Summaries Submitted

ARMY SPACE AND MISSILE DEFENSE COMMAND

| | | |
|-----------------|--|----------------------|
| Name | U.S. Army Space and Strategic Defense Command | |
| Address | CCSD-TC-PC 106 Wynn Drive, P.O. Box 1500 Huntsville, AL 35807 | |
| Director | Ms. Carolyn S. Thompson, TA&I Director, (205) 955-3069 Mr. Jackson G. Calvert, Cost Analysis Division Chief, (205) 955-3612 | |
| Size | Professional: | 11 |
| | Support: | 0 |
| | Consultants: | Mevatech Corporation |
| | Subcontractors: | SAIC |
| Focus | Systems Costs, Component Cost Analyses, Economic Analyses | |
| Activity | Number of projects in process: | TBD |
| | Average duration of a project: | 3 years |
| | Average number of staff members assigned to a project: | 1 |
| | Average number of staff-years expended per project: | 0.25 |
| | Percentage of effort conducted by consultants: | 25% |
| | Percentage of effort conducted by subcontractors: | 40% |

SMDC-1

Title: Software Cost Estimating

Summary: Primary DOD software cost estimating methods are models which require numerous subjective inputs (e.g., COCOMO, REVIC, etc.). In those cases where there is little knowledge of the subjective variables required to utilize these models, significantly large errors can result. The subject software estimating research provides alternative estimating methods, based on historical DOD costs, which may be used to verify/validate subjective models, or be used as standalone models. Estimating models include those expressly intended for use on each of missiles, radars, BMC³ and support systems. Unlike most subjective models, the database is known, and each is derived utilizing real historical data from each model category.

Classification:

Sponsor: Bill Hughes, (205) 955-5913, (hughesb@smdc.army.mil)

Performer: SAIC

Bill Hughes, Vicki Kitchens, and Tom Odom

Resources: FY Dollars Staff-years
\$70,000

Schedule: Start End
Apr 97 Oct 97

Data Base: Title:

Description: DOD systems

Automation: Strategic and Theater Automated Research (STAR)

Publications: *Software Cost Estimating Methodology*, Vicki Kitchens and Tom Odom

Category: II.A.2

Keywords: Estimating, Software, Missiles, Electronics/Avionics, Data Base, Method

SMDC-2

Title: Laser Research

Summary: Lasers remain an important weapon system candidate for ballistic missile defense, yet relatively little formal cost estimating methodology exists. The subject cost research focuses on research and estimating methodology development for chemical and diode-pumped solid state lasers, and pointing and tracking systems.

Classification:

Sponsor: Bill Hughes, (205) 955-5913, (hughesb@smdc.army.mil)

Performer: SAIC

Rick Taylor

Resources: FY Dollars Staff-years
\$70,000

Schedule: Start End
Apr 97 Dec 97

Data Base: Title:

Description: DOD systems

Automation: Strategic and Theater Automated Research (STAR)
Publications: *Laser Cost Research*, Rick Taylor
Category: II.A.2
Keywords: Estimating, Missiles, Electronics/Avionics, Advanced Technology, Method

SMDC-3

Title: Multi-Mode Seeker Cost Research

Summary: Recent developments in modern missile seeker technology have included the combination of widely different spectral bands in a single unit to overcome problems caused by degradation of signals due to weather conditions and other natural and man-made signal obscurants. As multi-mode seeker designs become more prevalent, better estimating methods are required to account for differences in design and integration of emerging technologies associated with these multi-mode seekers. This report documents cost research into the development of cost estimating relationships for both infrared and radio frequency seekers, and their integration.

Sponsor: Jack Calvert, (205) 955-3612, (calvertj@smdc.army.mil)

Performer: SAIC
 Jack Calvert and Robert Hatton

Resources: FY Dollars Staff-years
 \$150,000

Schedule: Start End
 Mar 97 Dec 97

Data Base: *Title:*
Description: DOD systems
Automation: Strategic and Theater Automated Research (STAR)

Publications: *Multi-Mode Seeker Cost Research*, Robert Hatton

Category: II.A.2

Keywords: Estimating, Missiles, Electronics/Avionics, Advanced Technology, Method, CER

NAVAL CENTER FOR COST ANALYSIS

| | | |
|-----------------|---|--------------------------|
| Name | Naval Center for Cost Analysis (NCCA) | |
| Address | 1111 Jefferson Davis Highway Suite 400, West Tower Arlington, VA 22202-4306 | |
| Director | Dr. Daniel A. Nussbaum, (703) 604-0293 CAPT John E. Fink, Deputy Director, (703) 604-0308 Mr. Rick Collins, Technical Director, (703) 604-0280 | |
| Size | Total: | 37 civilian; 15 military |
| | Professional: | 31 civilian; 15 military |
| Focus | <p>Naval Center for Cost Analysis (NCCA) is responsible for assisting (via IPTs) in the preparation of life cycle cost estimates for DoN weapon and automated information systems, administering the DoN Contractor Cost Data Reporting (CCDR) program, managing the DoN VAMOSC Program and coordinating the DoN cost research program.</p> <p>The focus of the NCCA cost research program is the following: improved acquisition and operating and support (O&S) cost/technical data bases (e.g., VAMOSC, ACDB, etc.); improved methods for estimating direct and indirect O&S costs; improved methods for estimating software development/maintenance costs; improved methods for estimating specific E&MD cost elements, e.g., non-recurring engineering, system integration, government in-house support, etc.; methods for estimating the cost impact of acquisition reform initiatives.</p> | |
| Activity | Number of projects in process: | 18 |
| | Average duration of a project: | 43.9 months |
| | Average number of staff members assigned to a project: | 1-2 |
| | Average number of staff-years expended per project: | 2-3 |
| | Percentage of effort conducted by consultants: | 59% |
| | Percentage of effort conducted by subcontractors: | 0% |

NCCA-1

Title: Top-Level Ship Operating and Support Cost Model

Summary: A parametric cost estimating model is being created that estimates annual ship operating and support costs as a function of such characteristics as light ship displacement, overall length, number of officers assigned, and number of enlisted assigned.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Jack Smuck, (703) 604-0292

Performer: NCCA in-house
Mr. Paul Hardin, (703) 604-0290

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | | 0.25 |
| 98 | | 0.1 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Jan 96 | Sep 98 |

Data Base: VAMOSC/other cost data and technical data

Publications: Report and appropriate spreadsheet files

Category: II.A.2

Keywords: Government, Estimating, Operations and Support, Statistics/Regression, Computer Model

NCCA-2

Title Ship Operating and Support Cost Analysis Model (OSCAM-Ship)

Summary: This model was developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. The model provides the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Jack Smuck, (703) 604-0292

Performer: NCCA in-house and British MoD
Mr. Paul Hardin, (703) 604-0290
Ms. Colleen McAuliffe, (703) 604-0271
LT Lee Lavinder, (703) 604-0279

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 97 | UK funds | 0.75 | 00 | \$25,000 | 0.25 |
| 98 | \$61,500 | 0.5 | 01 | \$25,000 | 0.25 |
| 99 | \$25,000 | 0.25 | 02 | \$25,000 | 0.25 |

Schedule:

| <u>Start</u> | <u>End</u> | |
|--------------|------------|---|
| Jan 97 | Nov 97 | Version 1 development |
| Dec 97 | Feb 98 | Version 2 development |
| Mar 98 | Sep 02 | Version 3 development and model maintenance |

Data Base: VAMOSC/other cost data and technical data

Publications: Mathematical model with supporting documentation

Categories: II.B, II.C, II.D

Keywords: Government, Estimating, Analysis, Operations and Support, Sustainability, Ships, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

NCCA-3

Title: Shipboard Systems Operating and Support Cost Analysis Model (OSCAM-Sys)

Summary: This model was developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. The model provides the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Jack Smuck, (703) 604-0292

Performer: NCCA in-house and British MoD
Mr. Paul Hardin, (703) 604-0290
Ms. Collen McAuliffe, (703) 604-0271
LT Lee Lavinder, (703) 604-0279

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 96 | UK Funds | 1.0 | 00 | \$25,000 | 0.25 |
| 97 | UK Funds | 0.75 | 01 | \$25,000 | 0.25 |
| 98 | \$61,500 | 0.25 | 02 | \$25,000 | 0.25 |
| 99 | \$25,000 | 0.25 | | | |

Schedule:

| <u>Start</u> | <u>End</u> | |
|--------------|------------|---|
| Jan 96 | Jun 97 | Version 1 development |
| Jul 97 | Jan 98 | Version 2 development |
| Feb 98 | Sep 02 | Version 3 development and model maintenance |

Data Base: VAMOSC/other cost data and technical data

Publications: Mathematical model with supporting documentation

Categories: II.B, II.C, II.D

Keywords: Government, Estimating, Analysis, Operations and Support, Sustainability, Weapon Systems, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

NCCA-4

Title: Aircraft Operating and Support Cost Model

Summary: This model will be developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. Many questions posed today (e.g., How can the Navy reduce operating and support costs while maintaining readiness?) cannot be addressed with existing tools. The model will provide the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs will include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Bill Stranges, (703) 604-0310

Performer: Contractor TBD
NCCA in-house

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 01 | \$104,000 | 1.0 |
| | 02 | \$53,000 | 0.5 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|----------------------|
| | Oct 00 | Sep 02 (development) |

Data Base: VAMOS/other cost data and technical data

Publications: Mathematical model with supporting documentation

Categories: II.B, II.C, II.D

Keywords: Government, Estimating, Analysis, Operations and Support, Sustainability, Aircraft, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

NCCA-5

Title: Avionics Operating and Support Cost Model

Summary: This model will be developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. Many questions posed today (e.g., How can the Navy reduce operating and support costs while maintaining readiness?) cannot be addressed with existing tools. The model will provide the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs will include both cost and availability. The inclusion of

availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Bill Stranges, (703) 604-0310

Performer: Contractor TBD
NCCA in-house

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|-----------|----------------|--------------------|
| | 99 | \$100,000 | 1.0 | 01 | \$25,000 | 0.25 |
| | 00 | \$50,000 | 0.5 | 02 | \$25,000 | 0.25 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|----------------------|
| | Oct 98 | Sep 00 (development) |
| | Oct 00 | Sep 02 (maintenance) |

Data Base: VAMOSC/other cost data and technical data

Publications: Mathematical model with supporting documentation

Categories: II.B, II.C, II.D

Keywords: Government, Estimating, Analysis, Operations and Support, Sustainability, Electronics/Avionics, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

NCCA-6

Title: Missile and Torpedo Operating and Support Cost Model

Summary: This model will be developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. Many questions posed today (e.g., How can the Navy reduce operating and support costs while maintaining readiness?) cannot be addressed with existing tools. The model will provide the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs will include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Jack Smuck, (703) 604-0292

Performer: NCCA in-house
Mr. Paul Hardin, (703) 604-0290

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 00 | \$100,000 | 1.0 |
| 01 | \$50,000 | 0.5 |
| 02 | \$25,000 | 0.25 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|----------------------|
| Oct 98 | Sep 01 (development) |
| Oct 01 | Sep 02 (maintenance) |

Data Base: VAMOSC/other cost data and technical data

Publications: Mathematical model with supporting documentation

Categories: II.B, II.C, II.D

Keywords: Government, Estimating, Analysis, Operations and Support, Sustainability, Missiles, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

NCCA-7

Title: Cost of a Sailor Study

Summary: This study determined the variable indirect costs (infrastructure costs) associated with manpower assigned to the at-sea operating forces. Variable indirect cost factors that distinguish between officer and enlisted personnel and further distinguish between officer communities (i.e., aviation, surface warfare, submarines, etc.) were developed. The study has been completed and study results have been incorporated into COMET.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Jack Smuck, (703) 604-0292

Performer: NCCA in-house
Mr. Leonard Cheshire, (703) 604-0285

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | | 0.25 |
| 97 | | 0.25 |
| 98 | | 0.25 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| FY96 | Dec 97 |

Data Base: Personnel Cost Estimating Database/Model

Publications: Results being incorporated into NCCA's Cost of Manpower Estimating Tool (COMET)

Category: II.C

Keywords: Government, Infrastructure, Study, Manpower/Personnel

NCCA-8

Title: Cost of Manpower Estimating Tool (COMET)

Summary: The Navy Billet Cost Factor Cost Estimation Model has been updated, revised, and reformatted to distinguish between direct manpower costs and variable indirect manpower costs. The study was completed at the end of FY97; additional work in FY98

focuses on the development of training modules, conducting training sessions and improving the COMET model's application to other systems that develop manpower requirements.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Jack Smuck, (703) 604-0292

Performer: SAG Corporation
900 S. Washington St., #109
Falls Church, VA 22046
Mr. Pat Mackin, (703) 538-4500

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|-----------|----------------|--------------------|
| | 97 | \$119,000 | 0.1 | 00 | \$80,000 | 0.25 |
| | 98 | \$77,000 | 0.25 | 01 | \$82,000 | 0.25 |
| | 99 | \$79,000 | 0.25 | 02 | \$84,000 | 0.25 |

Schedule: Start End
FY97 FY97 (initial update/revision)
FY98 FY02 (annual updates)

Data Base: Revised Navy Billet Cost Factors/Model

Publications: Mathematical model with supporting documentation

Category: II.C

Keywords: Infrastructure, Study, Government, Manpower/Personnel

NCCA-9

Title: Integration of Navy VAMOSC Database into a Relational Database Management System

Summary: Integration of the current weapon system operating and support (O&S) cost data into a relational database management system was initiated in FY96 and completed in FY97. The inefficient and incompatible system of batch processing and paper report distribution was replaced with a Tier II client-server application. VAMOSC users now have the ability to directly access detailed and summary level data

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Ms. Cheri Cummings, (703) 604-0275

Performer: Information Spectrum, Inc.
NCCA in-house
CDR Walter Bednarski, (703) 604-0273

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 96 | \$1,000,000 | 1.5 |
| | 97 | \$700,000 | 1.5 |

Schedule: Start End
Oct 95 Sep 97

Data Base: VAMOSC Ships, Air, Missile, and Torpedo Data
Publications: Documentation of system
Category: II.A.2
Keywords: Government, Operations and Support, Data Collection, Data Base

NCCA-10

Title: Expansion of VAMOSC Shipboard Systems Database
Summary: This effort is expanding the VAMOSC Shipboard Systems cost database by ten or more systems annually, including electronics, launching, and gun systems.
Classification: Unclassified
Sponsor: Naval Center for Cost Analysis
 1111 Jefferson Davis Highway
 Suite 400, West Tower
 Arlington, VA 22202-4306
 Ms. Cheri Cummings, (703) 604-0275
Performer: Information Spectrum, Inc.
 NCCA in-house
 CDR Walter Bednarski, (703) 604-0273

| | | | | | | |
|-------------------|-----------|----------------|--------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 96 | \$170,000 | 0.1 | 00 | \$170,000 | 0.1 |
| | 97 | \$170,000 | 0.1 | 01 | \$170,000 | 0.1 |
| | 98 | \$170,000 | 0.1 | 02 | \$170,000 | 0.1 |
| | 99 | \$170,000 | 0.1 | 03 | \$170,000 | 0.1 |

Schedule: Start End
 FY96 FY03

Data Base: VAMOSC Shipboard Systems
Publications: VAMOSC Shipboard Systems Report
Category: II.A.2
Keywords: Government, Operations and Support, Data Collection, Data Base

NCCA-11

Title: Indirect Cost Database Related to the VAMOSC Database
Summary: This effort is investigating the types of indirect cost, determining sources for this cost data, determining how the costs can be related to VAMOSC, and allocating the costs to weapons systems.
Classification: Unclassified
Sponsor: Naval Center for Cost Analysis
 1111 Jefferson Davis Highway
 Suite 400, West Tower
 Arlington, VA 22202-4306
 Ms. Cheri Cummings, (703) 604-0275
Performer: Information Spectrum, Inc.
 Mathtech, Inc.

NCCA in-house
Robert Hirama, (703) 604-0303

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | \$300,000 | 0.1 |
| 97 | \$85,000 | 0.1 |
| 98 | \$85,000 | 0.3 |
| 99 | \$85,000 | 0.3 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| FY96 | FY99 |

Data Base: VAMOSC Ships, Air, Missile, and Torpedo Data, STARS, WINPAT

Publications: Enhanced database with documentation

Category: II.C

Keywords: Government, Operations and Support, Infrastructure, Data Base

NCCA-12

Title: Linkage Between VAMOSC and the PPBS

Summary: This research investigated and documented the links between the historical, accounting cost data in VAMOSC and the planning and budgeting data in the PPBS. Tracking and consistency were established between the two systems in order to determine the completeness of the VAMOSC data and to allow VAMOSC to be used to do better planning and budgeting.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Ms. Cheri Cummings, (703) 604-0275

Performer: Mathtech, Inc.
NCCA in-house
CDR Walter Bednarski, (703) 604-0273

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | \$160,000 | 0.1 |
| 97 | \$100,000 | 0.1 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Apr 96 | Sep 97 |

Data Base: VAMOSC Ships, Air, Missile, and Torpedo Cost and Budget Data.

Publications: *Enhancing VAMOSC through Utilization of PPBS Data Structures*, Mathtech, Inc., August 1997.

Category: II.B

Keywords: Government, Operations and Support, Programming, Budgeting, Study

NCCA-13

Title: Platform Integration Cost Database/Model for Electronics

Summary: A database and cost estimating methodology will be developed for projecting hardware integration and hardware/software integration costs for shipboard and airborne electronics. The database should include cost data, technical characteristics, and other relevant information (e.g., software size) for a variety of systems, including sonar, radar, fire control, EW, and launching systems. The cost data should include relevant contractor and Navy in-house costs.

Classification: Cost Data: Business Sensitive
Technical Characteristics: Classified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Rick Collins, (703) 604-0280

Performer: Contractor TBD
NCCA in-house

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 99 | \$157,000 | 0.25 |
| 00 | \$161,000 | 0.25 |
| 01 | \$55,000 | 0.25 |
| 02 | \$56,000 | 0.1 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| FY99 | FY02 |

Data Base: Ship Systems Electronics Cost and Technical Characteristics

Publications: TBD

Category: II.A.2

Keywords: Government, Estimating, Weapon Systems, Missiles, Ships, Aircraft, Electronics/Avionics, EMD, Production, Data Collection, Data Base, Method

NCCA-14

Title: Government In-House Cost Database/Estimating Methodology

Summary: A cost database and methodology will be developed for estimating government in-house (GIH) development and procurement costs for ships, shipboard systems, aircraft and airborne systems. The database should include cost and other relevant information for a variety of platforms and systems, including sonar, radar, fire control, EW, launcher, etc.

Classification: Cost Data: Business Sensitive
Technical Characteristics: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Rick Collins, (703) 604-0280

Performer: Contractor TBD

NCCA in-house

Resources: FY Dollars Staff-years
 99 \$157,000 0.25
 00 \$161,000 0.25
 01 \$82,000 0.25
 02 \$84,000 0.1

Schedule: Start End
 FY99 FY02

Data Base: GIH costs for ships, shipboard systems, aircraft and airborne systems

Publications: TBD

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Weapon Systems, Missiles, Ships, Aircraft,
 Electronics/Avionics, EMD, Production, Data Collection, CER, Data Base, Method

NCCA-15

Title: Missile Special Tooling and Test Equipment Cost Estimating Relationship

Summary: The purpose of this study is to update the "Cost Estimating Relationships for Tactical Missile Special Tooling and Test Equipment (ST&TE)" study developed by Science Applications International Corporation in February 1986.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
 1111 Jefferson Davis Highway
 Suite 400, West Tower
 Arlington, VA 22202-4306
 Mr. Bill Stranges, (703) 604-0310

Performer: NCCA in-house

Resources: FY Dollars Staff-years
 98 0.5

Schedule: Start End
 Mar 98 Sep 98

Data Base: Historical cost data obtained from the government program offices and tactical missile manufacturers for Navy missile programs.

Publications: Completed study report

Category: II.A.1

Keywords: Government, Estimating, Analysis, Missiles, EMD, Production, Production Rate, Data Collection, Statistics/Regression, Data Base, Method, CER, Study

NCCA-16

Title: Rotary Wing Aircraft Cost Database

Summary: In the course of building cost estimates for aircraft currently in development, it was determined that there is a lack of detailed and normalized data from previous development and production efforts. The Naval Air Systems Command (NAVAIR) Cost Competency (Code 4.2) has initiated a broad effort to organize, analyze, and document historical government and contractor cost data reports for propulsion, avionics, fixed

wing airframes, and rotary wing airframes. The Naval Center for Cost Analysis (NCCA) is assisting NAVAIR in developing the rotary wing airframe database. This NCCA project is related to NAVAIR-9.

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR 4.2)
22347 Cedar Point Road, Unit 6
Patuxent River, MD 20670-1161
Mr. Joe Incorvia, (301) 342-2342

Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306

Mr. Bill Stranges, (703) 604-0310

Performer: NAVAIR 4.2 in-house
Mr. Gary Newton, (301) 757-2311
NCCA in-house

Mr. Dave Stem, (703) 604-0298
Mr. Matthew Schmit, (703) 604-0283

| | | | |
|-------------------|-----------|----------------|---------------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years (NCCA)</u> |
| | 98 | | 0.67 |
| | 99 | | 0.33 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Apr 98 | Dec 98 |

Data Base: Historical cost data obtained from the government and aircraft manufacturers including CCDRs and internal contractor reports.

Publications: Detailed, normalized cost and technical database.

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Aircraft, Helicopters, EMD, Production, Production Rate, Data Collection, Statistics/Regression, Data Base, Method, CER, Study

NCCA-17

Title: Missile Development Cost Estimating Model

Summary: The purpose of this study is update missile development cost estimating methodologies that have been used by NCCA over the past decade. These methodologies are underpinned by development programs from the 1970's and early 1980's, at least one generation of technology behind the current state of the art. This study will update these methodologies to reflect 1990's missile development efforts and integrate them into a comprehensive cost model.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Bill Stranges, (703) 604-0310

Performer: NCCA in-house

Mr. Jeff Cherwonik, (703) 604-0272
Mr. Jeff Wolfe, (703) 604-0296

Resources: FY Dollars Staff-years
98 1.0

Schedule: Start End
Mar 98 Sep 98

Data Base: Missile CCDRs and CPRs, ACDB

Publications: Completed study report and cost model.

Category: II.A.1

Keywords: Government, Estimating, Missiles, EMD, Statistics/Regression, Mathematical Model

NCCA-18

Title: Electronics Cost/Technical Database

Summary: A Navy electronics module for the Automated Cost Database (ACDB) is being developed. The database will include development/production cost, technical and programmatic data for a variety of shipboard and airborne electronics systems, including sonar, radar, fire control, and electronic warfare systems.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mrs. Cheri Cummings, (703) 604-0275

Performer: Tecolote Research, Inc.
1700 N. Moore Street, Suite 1400
Arlington, VA 22209
(703) 243-2800
NCCA in-house
Ms. Pamela Johnson, (703) 604-0294; Mr. Don Clarke, (703) 604-0282

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 97 | \$75,000 | 0.25 | 00 | \$80,000 | 0.25 |
| 98 | \$0 | 0.25 | 01 | \$82,000 | 0.25 |
| 99 | \$79,000 | 0.25 | 02 | \$84,000 | 0.25 |

Schedule: Start End
Jul 97 Sep 02

Data Base: Navy ACDB Electronics Module with Cost and Technical Data

Publications: TBD

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Analysis, Electronics/Avionics, EMD, Production, CPR/CCDR, Data Collection, Data Base

NCCA-19

Title: MADCAM (Microwave and Digital Cost Analysis Model)

Summary: The model is being populated with additional data. MADCAM estimates the first unit production cost (i.e., T_1) of electronics boxes in FY90 as a function of their distinguishing design characteristics and the technology of the components. This task was started in 1992 under an Air Force contract, and was then transferred to the Navy in late 1994. The model is in its fourth release and is called "MADCAM 96." It contains 83 data points covering space, air, and surface programs.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Scott E. Hine, (703) 602-5769

Performer: Tecolote Research, Inc.
Mr. John Hicks

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 95 | \$81,700 | |
| 97 | \$103,000 | |

Schedule:

| <u>Start</u> | <u>End</u> | |
|--------------|------------|------------------|
| Sep 95 | Feb 96 | Data collection |
| Sep 96 | Jun 98 | Model refinement |

Data Base: Electronic boxes cost and technical data

Publications: MADCAM 96 (Microwave and Digital Cost Analysis Model) Presentation Document, 29 February 1996

Category: I.B.1

Keywords: Government, Estimating, Missiles, EMD, Manufacturing, Data Collection, Computer Model

NCCA 20

Title: Transmit/Receive (T/R) Module Update

Summary: The current Tecolote cost model for solid state Transmit/Receive Modules was first released in 1991. The updated model will incorporate data from the following programs: GBR, International COBRA, CEC, and possibly F-22.

Classification: Secret

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mr. Scott E. Hine, (703) 602-5769

Performer: Tecolote Research, Inc.
Mr. Duncan Thomas

Resources: FY Dollars Staff-years
 97 \$115,000

Schedule: Start End
 Mar 97 Aug 98

Data Base: T/R Module Cost/Technical Data

Publications: An updated user manual and model documentation will be provided upon task completion.

Category: II.A.1

Keywords: Government, Estimating, Analysis, Electronics/Avionics, Space Systems, Production, Labor, Material, Data Collection, Computer Model

NCCA-21

Title: Software Development Estimating Handbook - Phase One

Summary: This handbook is a comprehensive software development estimating manual that provides: a) a centralized and well-documented compilation of existing databases; and b) formal procedures, tools, and guidelines for developing software effort, schedule, cost, and risk (growth) estimates. Raw effort database consists of 457 data points, including 151 program-level and 306 CSCI-level data points.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
 1111 Jefferson Davis Highway
 Suite 400, West Tower
 Arlington, VA 22202-4306
 Mrs. Cheri E. Cummings, (703) 604-0275

Performer: NCCA in-house
 Ms. Pamela L. Johnson, (703) 604-0294

Resources: FY Dollars Staff-years
 95 4
 96 2
 97 1
 98 1

Schedule: Start End
 Jan 95 Feb 98

Data Bases: Separate NCCA software databases covering effort, schedule, labor rate and SLOC growth

Publications: *Software Development Estimating Handbook - Phase One*, Naval Center for Cost Analysis, February 1998

Categories: II.A.2, II.C, II.D

Keywords: Government, Analysis, Electronics/Avionics, Life Cycle, Data Collection, Data Base, Schedule, Risk/Uncertainty

NCCA-22

Title: Weapon System Development Cost/Technical Database

Summary: This effort will entail maintaining/updating the NCCA software effort, schedule, labor rate, and SLOC growth databases developed for the *NCCA Software Development Estimating Handbook* (see NCCA-21). Near-term effort will target the collection of shipboard, avionics, and aircraft systems software development cost/technical data points.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Mrs. Cheri E. Cummings, (703) 604-0275

Performer: MCR Federal, Inc.
4165 E. Thousand Oaks Boulevard, Suite 235
Thousand Oaks, CA 91362-3810
(805) 496-7111
NCCA in-house
Ms. Pamela L. Johnson, (703) 604-0294

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 97 | \$50,000 | 0.1 | 01 | \$82,000 | 0.1 |
| 98 | \$100,000 | 0.1 | 02 | \$84,000 | 0.1 |
| 99 | \$79,000 | 0.1 | 00 | \$80,000 | 0.1 |

Schedule: Start End
Jul 97 Sep 02

Data Base: Separate NCCA software databases covering effort, schedule, labor rate and SLOC growth

Publications: TBD

Categories: II.A.1, II.A.2, II.C

Keywords: Government, Analysis, Electronics/Avionics, Life Cycle, Software, Data Collection, Data Base, Schedule, Risk/Uncertainty

NCCA-23

Title: Weapon System Software Development Estimating Methodology Update

Summary: This effort will entail maintaining/updating the NCCA software effort, schedule, labor rate, and SLOC growth estimating methodologies developed for the *NCCA Software Development Estimating Handbook* (see NCCA-21). Effort will include updating the current software development estimating tools and documenting the results. Additionally, effort will target the identification and assessment of commercially available software development estimating methodologies.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306

Performer: Mrs. Cheri E. Cummings, (703) 604-0275
Contractor, TBD
NCCA in-house
Ms. Pamela L. Johnson, (703) 604-0294

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 99 | \$78,500 | 0.25 | 01 | \$41,000 | 0.25 |
| 00 | \$80,500 | 0.25 | 02 | \$42,000 | 0.25 |

Schedule: Start End
Oct 98 Sep 02

Data Base: TBD

Publications: Update of the NCCA Software Development Estimating Handbook

Categories: II.A.1, II.A.2, II.C

Keywords: Government, Analysis, Electronics/Avionics, Life Cycle, Software, Data Collection, Data Base, Schedule, Risk/Uncertainty

NCCA-24

Title: Weapon System Software Maintenance Cost/Technical Database and Estimating Methodology

Summary: Software maintenance metrics and cost data will be collected on a variety of weapon systems. The initial effort will focus on shipboard electronic systems. This data will be used to develop software maintenance arrival/closure distribution curves and cost estimating relationships/factors. Follow-on efforts will focus on avionics and other aircraft software. This effort is a continuation of the NSWCCD project entitled, "Software Maintenance Cost Process Model."

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Ms. Cheri Cummings, (703) 604-0275

Performer: Technomics, Inc.
5290 Overpass Road #206
Santa Barbara, CA 93111
(805) 964-9894

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 96 | \$74,000 | 0.1 | 00 | \$80,000 | 0.15 |
| 97 | \$50,000 | 0.1 | 01 | \$82,000 | 0.15 |
| 98 | \$100,000 | 0.1 | 02 | \$84,000 | 0.15 |
| 99 | \$79,000 | 0.15 | | | |

Schedule: Start End
Feb 96 Sep 02

Data Base: TBD

Publications: TBD

Categories: II.A.1, II.A.2, II.C

Keywords: Government, Estimating, Software, Data Collection, Statistics/Regression, Data Base, CER, Operations and Support

NCCA-25

Title: Automated Information System (AIS) Software Cost/Technical Database and Estimating Methodology

Summary: This effort will: a) collect AIS software development and maintenance cost data and associated metrics (e.g., number of function points); b) create automated AIS software development and maintenance databases; c) determine what metrics drive AIS software costs; and d) develop cost estimating methodology. This effort will concentrate on developing tools for cost estimating in today's environment of 4GL, COTS, CASE tools, GUI builders, and open systems.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306
Ms. Cheri Cummings, (703) 604-0275

Performer: TASC, Inc.
4801 Stonecroft Boulevard
Chantilly, VA 20151-3822
(703) 633-8300
NCCA in-house

Ms. Pamela Johnson, (703) 604-0294

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|-----------|----------------|--------------------|
| | 98 | \$100,000 | 0.1 | 01 | \$82,000 | 0.15 |
| | 99 | \$79,000 | 0.1 | 02 | \$84,000 | 0.15 |
| | 00 | \$80,000 | 0.15 | | | |

Schedule: Start End
FY98 FY02

Data Base: AIS Software Development and Maintenance Cost/Technical Databases

Publications: TBD

Categories: II.A.1, II.A.2, II.C

Keywords: Government, Estimating, Demonstration/Validation, EMD, Operations and Support, Software, Statistics/Regression, Method, CER

NCCA-26

Title: Price Indices for Computers

Summary: This research will attempt to develop price indices for computers of different sizes such as PCs, mainframes, and Crays. First, Griliches at the National Bureau of Economic Research will review relevant literature, such as work. Data will be gathered and indices developed.

Classification: Unclassified

Sponsor: Naval Center for Cost Analysis
1111 Jefferson Davis Highway
Suite 400, West Tower
Arlington, VA 22202-4306

Performer: Dr. Brian Flynn, (703) 604-0301
 Naval Post Graduate School (NPGS), Monterey, CA
 NCCA in-house
 LCDR Ken Unger, (703) 604-0313

Resources: FY Dollars Staff-years
 97 \$10,000 0.15
 98 \$20,000 0.15

Schedule: Start End
 Jul 97 Jun 98

Data Base: Commercial computer price trends

Publications: TBD

Category: II.A.1

Keywords: Industry, Estimating, Production, Data Collection, Time Series, Statistics/Regression, Data Base, Method, CER

NCCA-27

Title: Commodity Investment Balance Assessment (CIBA) Model

Summary: CIBA replaces the Dynamic Investment Balance Simulator (DIBS) described in the 1997 IDA Cost Research Symposium document (NSWCCD-7) and is a tool used to conduct Cost as an Independent Variable (CAIV) affordability determinations. Current guidance requires that the Program Manager (PM) "... plan programs consistent with the DoD Strategic Plan, and based on realistic projections of likely funding available in the FYDP and in years beyond" (DoD 5000-2-R Ch-3.) CIBA can be used for such applications; it can operate in an affordability mode in which future funding requirements can be determined. A separate but related macro-economic model capable of generating a range of future Navy funding streams was also developed under this effort. The foregoing DIBS model was successfully demonstrated, and previous versions of CIBA have supported a variety of studies. Proposals have been submitted for further development and enhancements. This project is related to NSWCCD-4.

Classification: Database: Secret; Model: Unclassified

Sponsor: ASN (RDA) Acquisition Reform Office
 Michael D. Roberts, (703) 602-5506

Performer: Naval Surface Warfare Center, Carderock Division
 9500 MacArthur Boulevard
 West Bethesda, MD 20817-5700
 Mr. Michael F. Jeffers, Jr., (301) 227-1941; DSN: 287-1941
 Daniel Platt, (301) 227-2454, DSN: 287-2454
 Naval Surface Warfare, Dahlgren Division
 Dahlgren, VA 22448-5000
 Mr. Eric Rocholl, (540) 653-5236, DSN: 249-5236
 TASC, Inc.
 4801 Stonecroft Blvd.
 Chantilly, VA 20151-3559
 Mr. Richard L. Coleman, (703) 633-8300 x4536
 E-mail: rcoleman@ace.navy.mil

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 96 | \$229,000 | 2.5 |
| | 98 | TBD | TBD |

| | | | |
|------------------|--------------|------------|---|
| Schedule: | <u>Start</u> | <u>End</u> | |
| | Sep 96 | Apr 97 | Closed-loop O&S capability was incorporated, torpedo and missile commodities were added |
| | May 97 | Oct 98 | Continued improvement |

Data Base:

Title: Navy Force Availability Model (NFAM) Data Base

Description: Model contains a force structure database derived from the SASDT and Ship Management Information System, O&S cost factors derived from VAMOS-Ship/Air, maintained in Excel. To remain current, databases are periodically updated

Automation: Microsoft Excel Spreadsheet

Publications: Draft reports of CIBA model and operation. Relationships documented in briefing form

Category: II.A

Keywords: Government, Analysis, Policy, Programming, Budgeting, Weapon Systems, Life Cycle, Acquisition Strategy, Risk/Uncertainty, Mathematical Modeling, Statistics/Regression, Mathematical Model, Computer Model

NAVAL AIR SYSTEMS COMMAND

| | | |
|-----------------|---|-----------|
| Name | Naval Air Systems Command | |
| Address | Cost Department (AIR-4.2) 22347 Cedar Point Road, Unit 6 Patuxent River, MD 20670-1161 | |
| Director | Ronald J. Rosenthal, (301) 342-2454 | |
| Size | Professional: | |
| | NAWC-AD-LAKE: | 12 |
| | NAVAIR/NAWC-AD-PAX: | 142 |
| | NAWC-WD-CL: | 15 |
| Focus | <p>The Cost Department provides life cycle cost estimates, source selection cost evaluation, contractor performance measurement, cost analysis research, and cost/technical/programmatic databases for the purpose of providing a clear and comprehensive understanding of life cycle costs and attendant uncertainties to be used in developing, acquiring, and supporting affordable Naval Aviation Systems.</p> <p>Primary focus of NAVAIR cost research is as follows:</p> <ul style="list-style-type: none"> Affordable Readiness, Total Ownership Cost, and CAIV initiatives Model Development e.g., Aircraft O&S Costs, Propulsion O&S costs, SBIR Life Cycle Cost, and Naval Aviation Modifications Database Development e.g., Production Cross Checks for Fighters and Helicopters, Aircraft Learning Curve Trends Over Time. Joint Strike Fighter (JSF) related studies: affordability initiatives and cost analysis/estimating technology upgrades. CER Development e.g., for estimating missile SE/PM costs and relating missile production unit cost to development unit cost. | |
| Activity | Number of projects in process: | 10 |
| | Average duration of a project: | 1.5 years |
| | Average number of staff members assigned to a project: | 1-2 |
| | Average number of staff-years expended per project: | 1 |
| | Percentage of effort conducted by consultants: | 67% |
| | Percentage of effort conducted by subcontractors: | 0% |

NAVAIR-1

Title: Joint Strike Fighter (JSF) Advanced Cost Analysis Support (Cost of Stealth)

Summary: Provide cost and technical support in the areas of low observability. Examine proposed and alternative technologies that can contribute to JSF low observability. Determine costs associated with specific approaches for signature control. Further develop relationships to historical low observability life cycle cost data.

Classification: TBD

Sponsor: Naval Air Systems Command (AIR-4.2.1)
22347 Cedar Point Road, Unit 6
Patuxent River, MD 20670-1161
Joint Strike Fighter Program Office

Performer: Science Applications International Corporation (SAIC)

Resources: FY Dollars Staff-years
97 \$180,000
98 \$100,000

Schedule: Start End
Feb 97 Oct 98

Data Base: **Title:** JSF Low Observable Database
Description: List of all literature collected during search
Automation: Microsoft Access model

Publications: Study Report

Category: I.C.1

Keywords: Estimating, Analysis, Aircraft, Electronics/Avionics, Advanced Technology, EMD, Data Collection

NAVAIR-2

Title: Naval Aviation Modification Model (NAMM) Data Base

Summary: With current military downsizing, the emphasis in acquisition has been in the area of modifications. The NAMM model allows the analyst to bound a "roughly right" modification cost estimate in a short turnaround time. The effort began in February 1994 with an analysis of the tasks to be done to accomplish the NAMM objective and an identification of the cost, technical, and programmatic data to be incorporated into the model. This was followed by: (1) data collection; (2) data review and analysis; (3) data validation and verification; and (4) the development of a Microsoft Access 2.0 Windows-based run-time model. The model was briefed at the Department of Defense Cost Analysis Symposium (DODCAS) in 1996. The model has been tested and released. Currently, there are 78 data points. Future plans are to revisit the model in 1999, to update existing data points, and to add new data points.

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR-4.2A)
22347 Cedar Point Road, Unit 6
Patuxent River, MD 20670-1161
Jan Young, (310) 342-2419

Performer: Naval Air Systems Command
Maria Ponti, (310) 342-2307

Management Consulting & Research, Inc.
McLean, VA

Resources: FY Dollars Staff-years
94 \$204,000
95 \$100,000
96 \$50,000
97 \$30,000
98
99 \$50,000

Schedule: Start End
Feb 94 Mar 97 (Phase III end)

Data Base: Access 2.0

Publications: Study report, user's guide

Category: II.C

Keywords: Government, Estimating, Aircraft, Modification, Production, Data Collection, Data Base, CER

NAVAIR-3

Title: Maintenance Trade Decision Support System

Summary: Develop an automated support system to assist in the cost analyses of level and source of repair alternatives for aircraft electronics, components, engines, airframe, and weapons. The process should identify a screening mechanism to neck-down potential alternative maintenance candidates to those with the greatest cost savings potential. The tool should step a user through the pertinent cost elements to consider while identifying data sources, default values, and potential estimating relationships to utilize. Alternative maintenance concepts to be addressed include engineering change proposals (ECPs) to reduce cost by improving reliability and maintainability (R&M), changing maintenance level or depth of repair, and changing the source of maintenance. Initially based upon the NAVAIR-4.2.5 Maintenance Trade Cost Guidebook, the support system is to accommodate lessons learned in ongoing direct vendor delivery studies, commercial versus organic maintenance analyses, logistics ECP studies, and reliability improvement analyses.

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR-4.2.5)
48110 Shaw Road Unit 5, Suite 3321
Patuxent River, MD 20670-1906
John A. Johnston, (301) 342-0180

Performer: Ketron Division of The Bionetics Corporation

Resources: FY Dollars Staff-years
98 \$100,000 0.2

Schedule: Start End
Jun 97 May 98

Data Base: Direct Vendor Delivery Studies, Reliability Warranty Studies, Commercial vs. Organic Maintenance Studies

Publications: TBD

Categories: II.B, II.A

Keywords: Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Spares/Logistics, EMD, Production, Operations and Support, Readiness, Mathematical Modeling, Method, Computer Model

NAVAIR-4

Title: Maintenance Trade Guidebook

Summary: Develop a Maintenance Trade Guidebook that provides a consistent and systematic approach for performing all types of maintenance trades in the new acquisition environment. The guidebook contains recommendations for screening potential candidates, provides a recommended cost structure for various categories of maintenance trades (both Acquisition and Operations and Support cost elements) which are tailored for each study. It describes data sets, points of contact and key issues for each category of cost element. In addition, it contains a potential cost methodology for use for each element to be estimated. Alternative maintenance concepts to be addressed include engineering change proposals (ECPs) to reduce cost by improving reliability and maintainability (R&M), changing maintenance level or depth of repair, and changing the source of maintenance. It incorporates lessons learned in ongoing direct vendor delivery studies, commercial versus organic maintenance analyses, logistics ECP studies, and reliability improvement analyses.

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR-4.2.5)
48110 Shaw Road Unit 5, Suite 3321
Patuxent River, MD 20670-1906
Mark Mutschler, (301) 342-0253, John Johnston, (301) 342-0180

Performer: In-house study

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$0 | 1.0 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct 96 | Apr 97 |

Data Base: Direct Vendor Delivery Studies, Reliability Warranty Studies, Commercial vs. Organic Maintenance Studies

Publications: TBD

Categories: II.B, II.A

Keywords: Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Spares/Logistics, EMD, Production, Operations and Support, Life Cycle, Readiness, CER, Method, Study

NAVAIR-5

Title: NAVAIR Operating and Support Cost Model

Summary: Expand and refine the current NAVAIR aircraft O&S model to incorporate major data sets needed for program managers to implement affordable readiness, Total Ownership Cost, and CAIV initiatives. Develop an Excel spreadsheet modeling environment using Visual Basic to establish basic data entry templates, to allow integration of other electronic data inputs, and to provide a consistent and repeatable set of outputs. Besides traditional CAIG category elements and reporting, provide key information on cost drivers and their trends that impact a particular aircraft program. Provide: (1) current squadron manning for each maintenance level by work center and specialty; (2) major system reliability and maintainability trends across a several-year period; (3) a listing of all major O&S data sets and points of contact for more in-depth study; and (4) sensitivity analyses in critical areas like Depot Rework where costs are being changed by new Phased Maintenance and Reliability Centered Maintenance approaches. Publish on an annual basis the O&S costs in the new format for all major Navy T/M/S aircraft.

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR-4.2.5)
48110 Shaw Road Unit 5, Suite 3320
Patuxent River, MD 20670-1906
Jeff Keates, (301) 342-0251

Performer: In-house study

Resources: FY Dollars Staff-years
98 \$0 0.5

Schedule: Start End
Oct 97 Sep 98

Data Base: Flight Hour Program Costs, Depot Rework Costs, Personnel Cost, Sustaining Support Costs, Reliability and Maintainability Cost Drivers

Publications: Standard Estimating Model and T/M/S Reporting

Categories: I.A, II.B, II.A

Keywords: Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Propulsion, Airframe, Operations and Support, Readiness, Reliability, CER, Method, Computer Model

NAVAIR-6

Title: SBIR Life Cycle Cost Model Development

Summary: Develop an automated modeling environment operating under ACEIT to develop Operations and Support and Integrated Logistics Support Estimates for Naval Aviation Systems. Develop a compendium of Naval Aviation Data Sets, expand upon existing CERs, and develop new ones when applicable that will permit the develop of consistent and repeatable estimates at the aircraft and major subsystem levels. Incorporate estimating approaches used in current NAVAIR and NCCA Operations and Support Cost Estimating. Develop an ability to do sensitivity analyses in areas like manning, impact of reliability/maintainability changes, impacts of aging fleet, and other issues that impact future costs of operation. This effort is funded under a Small Business Innovation Research Project and is in Phase II with Brennan and Associates, Inc.

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR-4.2.5)
48110 Shaw Road Unit 5, Suite 3311
Patuxent River, MD 20670-1906
Laurence W. Stoll, (301) 342-0239

Performer: Brennan and Associates, Inc.
2614 W. Arkansas Lane, 560K
Arlington, Texas 76016

Resources: FY Dollars Staff-years
97-98 \$560,000 0.2

Schedule: Start End
Oct 96 Aug 98

Data Base: Databases to be established in Microsoft Excel Environment for O&S costs, ILS costs

Publications: Formal document cost study

Categories: I.A, II.A.1, II.A.2, II.B

Keywords: Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Airframe, Propulsion, Manpower/Personnel, Spares/Logistics, EMD, Production, Operations and Support, Readiness, Mathematical Modeling, Method, Computer Model, Data Collection, Study

NAVAIR-7

Title: System Engineering/Program Management Cost for Missile Development and Production

Summary: This study is to develop cost estimating methodologies for SE/PM for tactical missile development and production programs. The study addresses only contractor SE/PM and excludes from consideration government-incurred SE/PM cost. The database is compiled from cost history for several more recent Navy tactical missile programs and augmented with data from several older programs. A variety of analyses were performed to derive Cost Estimating Relationships (CERs) to estimate SE/PM development and production costs. This concludes Phase I effort of the study. Phase II will analyze data from a different perspective (e.g., by contractor) and develop CERs or a process for estimating SE/PM through head counts, direct charges, etc.

Classification: Unclassified but may contain proprietary data.

Sponsor: Naval Air Systems Command (AIR-4.2.3)
22347 Cedar Point Road, Unit 6
Patuxent River, MD 20670-1161
Joe Cardarelli, (301) 342-2422

Performer: Management Consulting & Research, Inc., and SAIC both of McLean, VA

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 95 | \$47,000 | |
| 96 | \$75,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Aug 94 | April 98 |

Data Base: To be developed

Publications: Study report

Category: II.A.2

Keywords: Government, Industry, Estimating, Missiles, Statistics/Regression, Data Collection, Method, CER

NAVAIR-8

Title: Aircraft Learning Curve Trends Over Time

Summary: Investigate fighter aircraft and attack aircraft manufacturing hours/pound learning curve trends from 1950 to present. Determine how the learning curve slopes have changed over time and identify possible reasons for the changes, such as, rate effects and changes in manufacturing processes.

Classification: Proprietary.

Sponsor: Naval Air Systems Command (AIR-4.2.7)
22347 Cedar Point Road, Unit 6
Patuxent River, MD 20670-1161
Joe Incorvia, (301) 342-2342

Performer: Naval Air Systems Command (AIR-4.2.7)

Resources: FY Dollars Staff-years
 98 N/A 0.25
 99 N/A 0.5

Schedule: Start End
 Oct 97 Sep 99

Data Base: Title: Historical Hours/Pound database
 Description:
 Automation: TBD

Publications: Study report

Category: II.A.1

Keywords: Labor, Manufacturing, Statistics/Regression, Aircraft, Government, Cost Progress Curve

NAVAIR-9

Title: Production Cross Checks for Fighter Aircraft and Helicopters

Summary: Develop cross checks for each of the functional hours categories (Manufacturing, Tooling, Quality Control, Engineering) for production fighter/attack aircraft and helicopters. The cross checks will be key inputs into the process of validating and verifying cost estimates which is an essential part of the *Perform Life Cycle Cost Estimating* process. Analysts can use the cross check to determine how their estimates track with historical programs.

Classification: Proprietary

Sponsor: Naval Air Systems Command (AIR-4.2.7)
 22347 Cedar Point Road, Unit 6
 Patuxent River, MD 20670-1161
 Joe Incorvia, (301) 342-2342

Performer: Naval Air Systems Command (AIR-4.2.1, 4.2.2 and 4.2.7)

Resources: FY Dollars Staff-years
 98 N/A 1.5
 99 N/A 0.5

Schedule: Start End
 Oct 97 Apr 99

Data Base: Title: Fight/Attack Aircraft and Helicopter Production Cross Checks
 Description:
 Automation: TBD

Publications: Process Toolkit

Category: II.A.1

Keywords: Aircraft, Helicopters, Production, Manufacturing, Engineering, Government, Analysis, Labor Statistics/Regression, Data Base, Method

NAVAIR-10

Title: Data for Propulsion O&S Model

Summary: Collect data for: (1) the mean time between removals for historically low time parts by T/M/S; (2) the percentage of engines sent to depot from IMA by T/M/S; (3) the unscheduled removal rate by T/M/S; and (4) any costs associated with (1), (2) and (3).

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR-4.2.4)
48110 Shaw Road, Unit 5
Patuxent River, MD 20670-1906
Allan Pressman, (301) 342-8292; Victoria Gutierrez, (301) 979-2279

Performer: Ketron Division of The Bionetics Corporation

Resources: FY Dollars Staff-years
99 \$100,000

Schedule: Start End
Oct 98 Sep 99

Data Base: **Title:** Propulsion O&S Data
Description: Propulsion O&S Data by T/M/S
Automation: O&S NAVEM Model (MS Excel)

Publications: Report, Data Base

Category: I.B.1

Keywords: Government, Operations and Support, Propulsion, Aircraft, Data Collection, Data Base

NAVAIR-11

Title: Platform Integration Study

Summary: Develop Platform Integration/Installation toolkit to include definitions, data, and CER's/analyses.

Classification: Unclassified

Sponsor: Naval Air Systems Command (AIR-4.2.4)
48110 Shaw Road, Unit 5
Patuxent River, MD 20670-1906
Dave Volpe, (301) 342- 8275

Performer: TBD

Resources: FY Dollars Staff-years
99 \$75,000

Schedule: Start End
Oct 98 Sep 99

Data Base: To be developed based on existing and new data

Publications: Report, Toolkit (users guide)

Category: II.A.2

Keywords: Government, Aircraft, Electronics/Avionics, Integration, Data Collection, Study, CER

NAVAIR-12

Title: Commodity Specific Escalation Indices

Summary: Develop commodity (e.g., Aircraft, Weapons, Electronics) specific inflation reports to adjust historical cost information to a selected calendar base year and estimate inflation effects on these commodities in the future. These reports are based on the historical weightings of cost components (i.e., labor, material and overhead costs.) These weightings in conjunction with the Data Resource Inc. (DRI) econometric capabilities and forecasting model, provide a comparative representation of specific weapon system economic changes over time and the indication of potential future trends.

Classification: Proprietary

Sponsor: Naval Air Systems Command (AIR-4.2.7)
22347 Cedar Point Road, Unit 6
Patuxent River, MD 20670-1161
Joe Incorvia, (301) 342-2307

Performer: Management Consulting & Research, Inc.

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$110,000 | 1.0 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct. 97 | Sep 98 |

Data Base:

Title: Commodity escalation indices

Description:

Automation: TBD

Publication: Commodity Specific Inflation Reports, Methodology (Process Toolkit)

Category: II.A.1

Keywords: Aircraft, Helicopters, Missiles, Electronics/Avionics, Propulsion, Labor, Material, Government, Analysis, Life Cycle, Method, Study, Data Collection, Economic Analysis

NAVAIR-13

Title: Life Cycle Cost Simulation Model

Summary: This project has developed a system dynamics simulation model of the life cycle operations and support processes for the H-60 series helicopters. The model can be used to quantify impacts of alternative support strategies, timing and impact of technology upgrades, acquisition and retirement decisions, and design trade-off studies on cost and schedule. The simulation is not probabilistic, but driven by cause-effect relationships which age the aircraft based on factors such as usage spectrum and which could be based either on current or proposed processes. The model inputs real world maintenance data and operational behavior and is sensitive to the myriad of relationships and complex web of feedback linkages inherent in the life cycle support process. The last phase of the project will provide a cost module that will translate model results into different types of costs such as labor, materials, inventory, etc.

Classification: Unclassified

Sponsor: Naval Air Systems Command (PMA-299)
47123 Buse Rd., Unit IPT
Patuxent River, MD 20670-1547
Dale Rizzolo (301) 757-3095
Navy Acquisition Center of Excellence (ACE)
Washington Navy Yard

901 M St. SE, Bldg 22
Washington, DC 20374
Mr. Mike Roberts (202) 610-7000

Performer: Decision Dynamics, Inc.
4600 East West Hwy.
Bethesda, MD 20814
Dr. Louis Alfeld, (301) 657-8500
URL <http://www.decisiondynamics.com/>

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | Prior FY | \$52,000 | |
| | 97 | \$301,000 | |
| | 98 | \$390,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Dec 96 | Aug 99 |

Data Base: None

Publication: Pending

Category: II.B

Keywords: Life Cycle, Operations and Support, Helicopters, Government, Labor, Material, Mathematical Modeling, Computer Model

NAVAIR-14

Title: Estimating Avionics Program Support Costs for Engineering and Manufacturing Development Contracts

Summary: As part of a Cost and Operation Effectiveness Analysis (COEA) for the Joint Emitter Targeting System (JETS) a data base was developed containing Engineering and Development (EMD) costs of avionics Weapon Repairable Assemblies (WRAs) from the F/A-18 program. The data base contains development and production costs with some related programmatic information. The avionics systems contained in the data base are; AN/ALR-67(V)3, APG-73, ASPI, and IDECM. The data base was developed as a tool for estimating hardware contractor's EMD costs for the design of certain WRAs, and support costs for Prime Mission Equipment (PME) development (i.e., System Test and Evaluation, System Engineering/ Program Management, and Data). The report discusses techniques for estimating EMD support costs and contains Cost Estimating Relationships (CERs) for estimating the design efforts.

Classification: Unclassified

Sponsor: Naval Air Systems Command
AIR-4.2.2 Cost Analysis
Building 2185, Suite 3190
22347 Cedar Point Road, Unit 6
Patuxent River, MD 20670-1161

Performer: Mr. Tom Yochim (301) 342-0170
MCR Federal, Inc.
22326 Exploration Drive, Suite 102
Lexington Park, MD 20653
Mr. Mark Sferra, (301) 737-4600

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$36,000 | |

| | | |
|----------------------------|--|--------------------------|
| <i>Schedule:</i> | <i><u>Start</u></i> | <i><u>End</u></i> |
| | Jul 97 | Dec 97 |
| <i>Data Base:</i> | Contained in study subset | |
| <i>Publication:</i> | Study Report | |
| <i>Category:</i> | II.A.1 | |
| <i>Keywords:</i> | Government, Estimating, Aircraft, Electronics/Avionics, EMD, Data Collection, Data Base, CER | |

NAVAL SEA SYSTEMS COMMAND

| | | |
|-----------------|---|---------|
| Name | Cost Engineering and Industrial Analysis Division, Comptroller Directorate Naval Sea Systems Command | |
| Address | 2531 Jefferson Davis Highway Arlington, VA 22242-5160 | |
| Director | Dr. Pat Tamburrino, Jr., (703) 602-1209 | |
| Size | Professional: | 59 |
| | Support: | 2 |
| | Consultants: | 0 |
| | Subcontractors: | 16 |
| Focus | O&S Cost Estimating; Total Ownership Cost Estimating; Commonality and Standardization of Ship Design and Construction Processes and of Ship Components or Sub-assemblies (impact on acquisition and O&S costs); Build Strategy Impact on Ship Costs; Ship Design Trade-Off Analysis Tools; Ship and Weapon System Cost Modeling | |
| Activity | Number of projects in process: | 9 |
| | Average duration of a project: | 2 years |
| | Average number of staff members assigned to a project: | 1 |
| | Average number of staff-years expended per project: | 2 |
| | Percentage of effort conducted by consultants: | |
| | Percentage of effort conducted by subcontractors: | 44% |

NAVSEA-1

Title: Private Shipbuilder Overhead Costs and Savings from Initiatives

Summary: The objectives of this study are to: 1) provide a better understanding of private shipbuilder overhead costs; 2) develop models to predict overhead costs at selected shipyards; 3) measure the savings associated with Sealift Technology Initiatives; and 4) assess the costs associated with excessive (acquisition) regulatory burden. Participation by private shipbuilders engaged in Navy work is sought by NAVSEA/IDA on a voluntary basis. However, data will be obtained from applicable SUPSHIP business offices and regional DCAA offices for those builders who do not care to participate.

Classification: Unclassified. *Proprietary* and *Business Sensitive* information will be captured and/or developed during the study but will be protected from disclosure.

Sponsor: OSD(PA&E), Program Analysis and Evaluation
Pentagon, Room 2C310
Washington, DC 20301
Gary Bliss, (703) 695-4348
Naval Sea Systems Command (SEA 0177)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160
John Bissell, (703) 602-5018; DSN: 332-5018

Performer: IDA
1801 N. Beauregard Street
Alexandria, VA 22311
Dr. Stephen J. Balut, (703) 845-2527

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 94 | \$100,000 | |
| 95 | \$110,000 | |
| 96 | \$110,000 | |
| 97 | \$110,000 | |
| 98 | \$90,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Mar 94 | Dec 98 |

Data Base: Database will support development and improvement of overhead cost models.

Publications: TBD

Categories: II.A.2, II.D

Keywords: Industry, Estimating, Ships, Overhead/Indirect, Data Collection, Mathematical Modeling, Study

NAVSEA-2

Title: Shipbuilding Process Simulation Model

Summary: This project has developed a system dynamics simulation model of the shipbuilding process that can be used to quantify impacts on cost and schedule of ship construction delays, construction process reconfiguration, alternative build strategies, and design trade-off studies. The model is sensitive to the myriad cause-and-effect relationships and the complex web of feedback linkages inherent in the ship production process.

Classification: Unclassified

Sponsor: Naval Sea System Command (SEA 0171 and PMS 317)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160
Jerome Acks, (703) 602-1308, ext. 166; DSN: 332-1308

Performer: Decision Dynamics, Inc.
4600 East West Hwy.
Bethesda, MD 20814
Dr. L. Alfred, (301) 657-8500
URL <http://www.decisiondynamics.com/>

Resources:

| | | |
|-----------|----------------|--------------------|
| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| Prior FY | \$535,000 | |
| 97 | \$94,000 | |

Schedule:

| | |
|--------------|------------|
| <u>Start</u> | <u>End</u> |
| Dec 94 | Sep 98 |

Data Base: None

Publications: *Final Report: Dynamic Simulation Model of Shipbuilding Construction Delays*
Computer Program: ShipBuild V0.9, 15 Dec 1996

Category: II.B

Keywords: Government, Industry, Analysis, Estimating, Ships, Labor, Material, Engineering, Manufacturing, WBS, Mathematical Model, Cost/Production Function, Computer Model

NAVSEA-3

Title: Early Warning System (EWS) Integration

Summary: NAVSEA acquisition managers use an on-line service that allows access to contract cost/schedule performance status. Two commercially available models, Performance Analyzer (PA) and WINSIGHT, provide detailed lower level and summary levels to managers. This project will update the interface and integration between EWS, and PA and WINSIGHT. This will provide managers the flexibility to use their adopted analysis tools/models, allow the analysis results to flow to Navy management without interruption, and allow other organizations to benefit from the use of EWS.

Classification: Business Sensitive

Sponsor: Naval Sea Systems Command (SEA 0171)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160
Robert Meyer, (703) 602-6570; DSN: 332-6570

Performer: TBD

Resources:

| | | |
|-----------|----------------|--------------------|
| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| 99 | TBD | |

Schedule:

| | |
|--------------|------------|
| <u>Start</u> | <u>End</u> |
| TBD | |

Data Base: TBD

Publications: TBD

Categories: II.B, II.C

Keywords: Industry, Government, Analysis, Estimating, Review/Monitoring, Ships, Production, Labor, Material, Overhead/Indirect, Engineering, Manufacturing, WBS, Data Collection, Data Base

NAVSEA-4

Title: Material Vendor Survey

Summary: The objective of this annual survey is to capture future price trends and last year's actual price change for material used in Navy ship construction. The survey samples over 900 shipboard material and equipment suppliers, requesting their price changes for the current year and their projections of future price changes for the next two years. The results are grouped according to Ship Work Breakdown Structure (SWBS- Cost Groups 1-9), and indices are calculated.

Classification: Unclassified

Sponsor: Naval Sea Systems Command (SEA 0177)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160
John Bissell, (703) 602-5018; DSN: 332-5018

Performer: NAVSEA Shipbuilding Support Office (NAVSHIPSO)
Norfolk Naval Shipyard
Detachment, Code 2900
Philadelphia, PA 19112-5087
Bob Laarkamp

Resources: FY Dollars Staff-years
Each year \$125,000

Schedule: Start End
Oct each year Sep each year

Data Base: End use is MATCER Data File update. Backup data is maintained at NAVSHIPSO.

Publications: None

Category: II.A.1

Keywords: Industry, Estimating, Ships, Material, WBS, Economic Analysis, Survey

NAVSEA-5

Title: AACEI Cost Model for Aircraft Carriers

Summary: The objective is to update the ASSET ACEIT EXCEL Interface (AACEI) cost modeling process and tailor it for use to estimate the end cost of ship alternatives under study by the Carrier program office(s). A weight-based cost model formulated within the Automated Cost Estimating Integrated Tools (ACEIT) was developed under previous tasks (Sealift, SC21). Weight information for a ship designed in ASSET is electronically transferred by the ASSET user to the ACEIT cost model where the cost of the ASSET ship design is generated at the two or three digit level of detail. This process is consistent with the SEA 017 Unit Price Analysis and End Cost methodology and provides immediate insight into the cost impact of design changes. For the cost analyst, design engineer, and decision makers, this provides the ability to compare alternatives and better understand the cost consequences of design options. It also provides the ability to identify where effort should be focused (areas of maximum cost impact) and sort the data to rank order cost drivers by

1, 2 and 3-digit levels of the SWBS. Automated graphical and tabular presentations allow both cost and engineering analysts to identify anomalies in the cost and the technical characteristics of each alternative and more readily identify inadvertent errors in the technical or cost inputs. Proposed work will expand the model to incorporate a present value analysis technique (compatible with other such PV modeling of the carrier office projects) and continue the development of aircraft carrier CERs and estimating factors to capture differences from the source CERs to the technologies and ship features under consideration; expand to cover other elements of the ship end cost, e.g., GFE, Escalation and Plans; develop additional automated, tailored graphical and tabular reports; and conduct preliminary work to implement the integration of O&S estimating and other improved estimating techniques and tools (i.e., Performance Based Cost Modeling and PODAC); and add functionality to ACE to improve efficiency in the Navy environment.

Classification: Unclassified

Sponsor: Naval Sea System Command (SEA 01712)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160

Irv Chewning/Steve Moretto/Robin Hull, (703) 413-4913/4935

Performer: Tecolote Research, Inc.
1700 N. Moore Street, Suite 1400
Rosslyn Center Office Building
Arlington, VA 22209

Alfred Smith, (703) 243-2800, ext. 335

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | Prior FY | \$350,000 | |
| | 98 | \$450,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 98 | Oct 99 |

Data Base: Carriers

Publications:

Category: II.A

Keywords: Government, Analysis, Review, Ships, Concept Development, Labor, Material, Overhead/Indirect, Engineering, Acquisition Strategy, Data Collection, Mathematical Modeling, CER, Method, Mathematical Model, Study

NAVSEA-6

Title: SEA 0177 Shipyard Workload Model Improvements

Summary: The objective is to document existing network software operating systems that make up the shipyard workload model, and correct and implement solutions to a number of problems requiring an immediate fix.

Classification: Unclassified. *Proprietary* and *Business Sensitive* information will be captured and/or developed during the study but will be protected from disclosure.

Sponsor: Naval Sea Systems Command (SEA 01)
2531 Jefferson Davis Highway
Arlington, VA. 22242-5160
Robert Storey, (703) 602-3538

Performer: Naval Sea Systems Command (SEA 0177)
 2531 Jefferson Davis Highway
 Arlington, VA 22242-5160
 John Bissell, (703) 602-5018
 AAC Associates, Inc.
 2361 Jefferson Davis Highway
 Heitman Center ML 108
 Arlington, VA. 22202
 Surendra Gupta, (703) 415-4400

Resources: FY Dollars Staff-years
 97 \$65,535

Schedule: Start End
 3 Apr 97 30 Sep 97

Data Base: Database will support Shipyard Workload Model improvements.

Publications: None

Category: II.A.2

Keywords: Industry, Analysis, Ships, Production, Acquisition Strategy, Cost/Production Function, Computer Model

NAVSEA-7

Title: COTS Electronic Technology Assessment/Refresh Cost Model

Summary: Development of a cost model as an element of an overall process for COTS planning and budgeting. The cost model is intended to support decision making on COTS upgrades and technology refreshes driven by rapid COTS product cycles, availability, reliability, and supportability. The primary use of the model is to optimize out-year support costs for electronic systems by performing cost tradeoffs of viable solutions for near and long-term support problems of COTS based electronic systems. The output of the cost model provides life cycle support costs with respect to fiscal years and is intended to be used as a planning and budgeting tool.

Classification: Unclassified

Sponsor: Naval Sea Systems Command (PMS 411)
 2531 Jefferson Davis Highway
 Arlington, VA 22242-5160
 CAPT Richard Goldsby, (703) 602-5064
 Naval Surface Warfare Center, Crane Division
 Sustainable Hardware and Affordable Readiness Practices (SHARP) Program
 Crane, IN 47522
 Mike Grubb, (812) 854-5089

Performer: Naval Surface Warfare Center, Crane Division
 Code 602
 Crane, IN 47522
 Mike Roby, (812) 854-2406

Resources: FY Dollars Staff-years
 96 \$50,000
 97 \$260,000

Schedule: Start End
 Jul 96 Sep 97

Data Base: None

Publications: Technology Assessment Guidebook

Categories: I.B, I.C

Keywords: Government, Estimating, Programming, Budgeting, Electronics/Avionics, Life Cycle, Modification, Sustainability, Engineering, WBS, Data Collection, Survey, Mathematical Modeling, Computer Model

NAVSEA-8

Title: Total Ownership Cost Reduction Process and Templates

Summary: This project is aimed at developing a process for reducing the Total Ownership Cost (TOC) of Navy program. TOC is defined as all costs associated with the research, development, procurement, operation, logistical support and disposal of an individual weapon system including the total supporting infrastructure that plans, manages and executes that weapon system program over its full life. TOC includes the cost of requirements for common support items and systems that are incurred because of introduction of that weapon system. It excludes indirect "non-linked" Navy and DoD infrastructure costs that are not affected by individual weapon systems' development, introduction, deployment or operations. NAVSEA, in cooperation with NAVAIR, is developing the process. In addition to the process, the project will develop tools necessary for implementation. These will include standard templates and a database for documenting and tracking TOC Reduction Plans and cost savings.

Classification: Unclassified

Sponsor: Naval Sea System Command (SEA 017)
 2531 Jefferson Davis Highway
 Arlington, VA 22242-5160
 Pat Tamburrino, (703) 602-1209, ext. 169; DSN: 332-1209
 Naval Air Systems Command (AIR 4.2)
 Naval Air Station, Patuxent River, Maryland
 Ron Rosenthal, (301) 342-2454

Performer: Naval Sea System Command (SEA 0171)
 2531 Jefferson Davis Highway
 Arlington, VA 22242-5160
 Robert Meyer, (703) 602-6570, ext. 165; DSN: 332-6570

Resources: FY Dollars Staff-years
 98 \$250,000 2
 99 TBD

Schedule: Start End
 Dec 97 Jun 99

Data Base: Under development

Publications: web site: <http://www.navsea.navy.mil/sea017/toc.htm>

Category: II.C

Keywords: Government, Analysis, Estimating, Review/Monitoring; Weapon Systems, Aircraft, Ships, Land Vehicles, Electronic/Avionics, Facilities, Infrastructure; Life Cycle; WBS, Fixed Costs, Variable Costs, Readiness, Modification; Data Collection, Economic Analysis; Data Base, Method, Computer Model.

NAVSEA-9

Title: Government Furnished Equipment/ Materiel (GFE/GFM) Process Improvement Initiative.

Summary: This project initiative is intended to develop a self-serving database with WEB interface that the NAVSEA community can use to generate, analyze, and estimate the costs of GFE/GFM used on the various ship platforms designed and acquired by the Naval Sea Systems Command.

Classification: Business Sensitive

Sponsor: Naval Sea System Command (SEA 0171B)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160
Lorraine Andriani, (703) 602-1679, ext. 159; DSN: 332-1679

Performer: TBD

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 98 | \$250,000 | |
| | 99 | TBD | |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | May 98 | Jan 99 |

Data Base: TBD

Publications: None to date

Category: II.B

Keywords: Government, Industry, Analysis, Estimating, Ships, Budgeting, Acquisition Strategy, Production, Data Base, Computer Model

NAVAL SURFACE WARFARE CENTER, DAHLGREN DIVISION

| | | | |
|-----------------|---|-------------|--|
| Name | Cost/Affordability Branch Naval Surface Warfare Center, Dahlgren | | |
| Address | Code T50 (Warfare Analysis Division) Dahlgren, VA 22448-5000 | | |
| Director | Amanda Cardiel | | |
| Size | Professional: | 9 | |
| | Support: | 0 | |
| | Consultants: | 0 | |
| | Subcontractors: | As required | |
| Focus | <p>The Cost/Affordability Branch resides within the Warfare Analysis and Systems Department at the Naval Surface Warfare Center, Dahlgren Division (NSWCDD). The Office has NSWCDD responsibility for providing leadership in the areas of Cost and Operational Effectiveness Analysis (COEA) for Surface Navy Combat Systems and Theater Tactical Ballistic Missile Defense (TBMD). Particular areas of expertise and emphasis include developing and maintaining models, databases, and procedures for performing these functions, technology assessments, life cycle cost estimates, budget and force-level analyses, performance-based cost models, and product-oriented cost models.</p> <p>The current focus of the NSWCDD cost research program is: models to generate cost estimates for complex surface navy combat system equipment and TBMD ordnance during concept formulation and DemVal phases of a program; data collection in preparation for model development to estimate life cycle software maintenance workload during the concept formulation and DemVal phases; performance-based methods for estimating life cycle cost; implementing Cost as an Independent Variable and for analyzing total ownership cost.</p> | | |
| Activity | Number of projects in process: | 3 | |
| | Average duration of a project: | 2 years | |
| | Average number of staff members assigned to a project: | — | |
| | Average number of staff-years expended per project: | — | |
| | Percentage of effort conducted by consultants: | — | |
| | Percentage of effort conducted by subcontractors: | — | |

NSWCDD-1

Title: TBMD Missile Model

Summary: This effort is directed towards the development of a model to estimate the various missile designs in the TBMD COEA. The missile cost model is a workbook spreadsheet that operates in Microsoft Excel. This model is complex in that it integrates a number of cost models and individual CERs. Missile subsystem costs are estimated by cost models operating at the assembly level or by CERs estimating total subsystem costs. New CERs have been developed for some of the missile subsystems during this COEA.

Classification: Unclassified (Proprietary)

Sponsor: Naval Surface Warfare Center (Code T51)
Dahlgren Division
Dahlgren, Virginia 22448-5000

Performer: Naval Surface Warfare Center (Code T51)
Dahlgren Division (Combat Systems and Cost Model Integration)
Dahlgren, Virginia 22448-5000
Ted Towles, (540) 653-7369; Amanda Cardiel
Technomics, Inc.
5290 Overpass Road, Suite 206
Santa Barbara, CA 93111
Eugene Waller, (805) 964-9894; Chris Brown

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | Prior FY | \$180,000 | |
| | 96 | \$20,000 | |
| | 97 | \$20,000 | |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Feb 95 | Sep 97 |

Data Base: Data used to create the models and CERs were from various Army and Navy development and production programs that were deemed to be relevant to current technology missiles. There are two-seeker hardware cost models resident in the missile cost model, one for infrared and one for RF seekers. These two models are composed of a number of assembly-level CERs. The missile cost model includes CERs for rocket motors, divert/attitude control systems, target detectors, inertial measurement units, GPSs, control sections, wings and fins, batteries, data links, and integration. Besides hardware costs, CERs are used to estimate non-recurring development, development support, and procurement support. All models and CERs were developed between 1992 and 1995.

Publications: TBD

Category: II.C

Keywords: Government, Estimating, Missiles, EMD, Test and Evaluation, Production, Statistics/Regression, Mathematical Model

NSWCDD-2

Title: RDT&E Development Support CERs for Radar Programs

Summary: Using hardware costs as input variables in CERs have been used in the past as a method of estimating below the line costs. One problem with this approach becomes evident with estimating the costs of new radars, which are comprised of hundreds of replicating

components. There is no logical reason why the below the line costs should scale with the hardware costs in this situation. Awareness of this problem led the Naval Surface Weapons Center/Dahlgren Division to request that Technomics examine and develop CERs, if feasible, using the radar RDT&E database available in MCR Report TR-8740-2, *Electro-Optical, Missile, Radar And Avionics System Cost Research: Cost Analysis Techniques Report: Volume 4: Electronic Systems RDT&E Cost Model*.

Classification: Unclassified

Sponsor: Naval Surface Warfare Center (Code T51)
Dahlgren Division
Dahlgren, Virginia 22448-5000
John Kozicki, (540) 653-8308

Performer: Technomics, Inc.
5290 Overpass Road, Suite 206
Santa Barbara, CA 93111

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$5,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 97 | Feb 98 |

Data Base: Stated Above

Publications: *Development Support CERs For Radar Program*, TR-9601-03

Category: II.C

Keywords: Government, Estimating, Weapons Systems, Ships, Electronics/Avionics, Mathematical Modeling, CER

NAVAL SURFACE WARFARE CENTER, CARDEROCK DIVISION

| | | |
|-----------------|--|-----|
| Name | Cost and Operational Effectiveness Assessments Department, Code 21 Cost and Economic Analysis Group, Code 211 Naval Surface Warfare Center, Carderock Division | |
| Address | 9500 MacArthur Boulevard West Bethesda, MD 20817-5000 | |
| Director | Robert R. Jones | |
| Size | Professional: | 8 |
| | Support: | 3 |
| | Consultants: | 0 |
| | Subcontractors: | 3 |
| Focus | | |
| Activity | Number of projects in progress: | 10 |
| | Average duration of a project: | 2 |
| | Average number of staff members assigned to a project: | 2 |
| | Average number of staff-years expended per project: | 4 |
| | Percentage of effort conducted by consultants: | 0 |
| | Percentage of effort conducted by subcontractors: | 20% |

Title: Cost Module for Sealift Ship Version of ASSET

Summary: The objective is to update the cost module of the ASSET ship design synthesis model and tailor it for use in assessing technology developments for sealift ships for the Mid-Term Sealift Ship Technology Development Program (MTSSTDP). The approach taken is to develop an electronic interface to transfer information between ASSET and a cost model formulated within the Automated Cost Estimating Integrated Tools (ACEIT). Technical information is produced in ASSET and electronically transferred by the ASSET user to ACEIT, which automatically estimates the cost of the ship; the cost estimate is then automatically transferred back to ASSET to provide near-immediate cost feedback to design engineers as they use ASSET. Early effort focused on basic construction cost estimates. Current work expands upon this and adds life cycle costing capability.

Classification: Unclassified

Sponsor: Naval Sea System Command (SEA 01712)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160

Jerome Acks, (703) 602-1308; DSN: 332-1308

Performer: Carderock Division, Naval Surface Warfare Center (Code 21)
9500 MacArthur Boulevard
West Bethesda, MD 20817-5700

C. F. Snyder, (301) 227-5479; DSN: 287-5479
Chris Whitacre, (301) 227-3003; DSN: 287-3003

Tecolote Research, Inc.
1700 N. Moore Street, Suite 1400
Rosslyn Center Office Building
Arlington, VA 22209

Alfred Smith, (703) 243-2800

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | Prior FY | \$220,000 | |
| | 96 | \$60,000 | |
| | 97 | \$150,000 | |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Feb 94 | Sep 97 |

Data Base: None

Publications: *MTSSTDP Ship Construction Cost Model - Training & User's Guide (vol. 1)*
MTSSTDP Ship Construction Cost Model - Appendices (vol. 2)
MTSSTDP Ship Construction Cost Model and Cargo Ship Assessment Model (CSAM)

Category: II.A.2

Keywords: Government, Analysis, Review, Ships, Concept Development, Labor, Material, Overhead/Indirect, Engineering, Acquisition Strategy, Data Collection, Mathematical Modeling, CER, Method, Mathematical Model, Study

Title: Product-Oriented Design and Construction (PODAC) Cost Model

Summary: This cost model will incorporate a Product Work Breakdown Structure and be sensitive to changes in shipbuilding strategies, ship construction process, use of common modules, zonal architectures, and equipment standardization. It will assist in assessment of the cost and affordability of design commonality alternatives that have potential for reducing acquisition and ownership costs of ships in conjunction with the NAVSEA Affordability Through Commonality (ATC) Program and the Mid-Term Sealift Ship Technology Development Program (MTSSTD). Concept exploration phase was completed with selection of a baseline from conceptual models developed by cost research projects—Development of Product-Oriented Cost Estimating Tools and Near-Term Prototype PODAC model. The prototype is currently being installed and implemented, by an integrated product team composed of Navy, shipyard personnel, and model developers, at the five surface shipyards and at NAVSEA. Partial functionality of the model was demonstrated in February 1997. Cost model validation testing is being performed at the shipyards. The focus of the cost model development was redirected to primarily support engineering tradeoff studies. FY 98 efforts include model validation, model demonstration through tradeoff studies and model capability expansion into the life cycle cost area.

Classification: Unclassified

Sponsor: Naval Sea System Command (SEA 017R)
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9500 MacArthur Boulevard
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John Trumbule, (301) 227-5570; DSN: 287-5570
Robert Jones (310) 227-4012; DSN: 287-4012
Designers & Planners, Inc.; SPAR, Inc.; University of Michigan Transportation Research Institute; Avondale Shipbuilding, Inc.; Bath Iron Work, Inc.; Ingalls Shipbuilding, Inc.; National Steel and Shipbuilding Company; and Newport News Shipbuilding

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| Prior FY | \$295,000 | | 98 | \$800,000 | |
| 96 | \$990,000 | | 99 | \$800,000 | |
| 97 | \$862,000 | | | | |

Schedule:

| <u>Start</u> | <u>End</u> | |
|--------------|------------|--|
| Sep 94 | Sep 95 | Concept Exploration |
| Oct 95 | Feb 97 | Prototype Dem/Evaluation |
| Apr 97 | Apr 98 | Model Installation/Implementation at shipyards |
| Apr 98 | Mar 00 | Life Cycle Cost Capability |

Data Base: Resident within cost model

Publications: *Production-Oriented Design and Construction (PODAC) Cost Model Plan of Action and Milestones and Functional Specification (FY 96)*
Cost Estimating Relationships Development Plan (1997)
PODAC Cost Model Validation Plan (1997)
Product-Oriented Design and Construction Cost Model (1998)

Categories: II.A.2, II.B
Keywords: Government, Estimating, Ships, Production, Labor, Material, Overhead/Indirect, Engineering, Manufacturing, WBS, Case Study, Survey, Cost/Production Function, Method, Mathematical Model, Study

NSWCCD-3

Title: Surface Combatant Performance-Based Life Cycle Cost Model (PBCM)
Summary: The objective was to develop a cost model sensitive to high-level performance parameters for predicting the Life Cycle Cost (LCC) of major surface combatants. The resulting model is envisioned as a tool to provide quick ROM cost estimates of surface combatant ship concepts during the Cost Operational Effectiveness Analysis (COEA) process, or to investigate the cost implications of alternative mission requirements prior to Milestone II. Phase I of the effort, the development of a pre-prototype cost model, is complete. Phase I Deliverables included a POA&M, Project Definition Report, and pre-prototype model. Phase II is also complete, having developed a production model complete with a survivability module and documentation of the algorithms. Phase III will extend the capabilities of the model, focusing on RDT&E, Operating and Support costs, and production modeling. These and other features will be incorporated into the model during FY98 if needed to support the DD21 program. Note that the Surface Combatant PBCM is largely integrated with the Aircraft Carrier PBCM, supporting the CVX program.

Classification: Classified/Business Sensitive

Sponsor: Naval Sea System Command (SEA 0172)
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Performer: Carderock Division, Naval Surface Warfare Center (Code 21)
 9500 MacArthur Boulevard
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 Michael Jeffers, (301) 227-1941; DSN: 287-1941
 William Whitacre, (301) 227-3644; DSN: 287-3644
 Daniel Platt, (301) 227-2454; DSN: 287-2454
 Naval Surface Warfare Center (Code A50), Dahlgren Division
 Dahlgren, VA 22448-5000
 Amanda Cardiel, (540) 653-5235; DSN: 249-5235

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|-----------|----------------|--------------------|
| Prior FY | | \$100,000 | | 97 | \$50,000 | |
| 96 | | \$120,000 | | 98 | \$0 | |

Schedule: Start End
 Jun 93 Sep 97

Data Base: TBD

Publications: Project Definition Report, Algorithms Report

Categories: II.A.2, II.D

Keywords: Government, Estimating, Analysis, Electronics/Avionics, Concept Development, Demonstration/Validation, Labor, Material, Overhead/Indirect, Data Collection, Statistics/Regression, CER, Data Base, Method, Computer Model

Title: Navy Force Affordability Model (NFAM)

Summary: This model replaces the previous NFAM and the Dynamic Investment Balance Simulator (DIBS). It relates future Navy force structures and budgets. It has two principal modes of operation. The first, derived from previous versions of NFAM, calculates budgets based on the user's input of force structure plans, including retirements and new procurements. The second, derived from DIBS, uses a goal-seeking algorithm to determine force structures based on the user's input of budgets. A third, hybrid, mode combines these capabilities, so that force structure decisions may be specified for some systems and not for others. In all modes, the model tracks force structure decisions and funding needs at the SASDT category level as well as the ship class or aircraft type/model/series (T/M/S) level. In the goal-seeking mode, the model allows examination of tradeoffs between acquisition (future force structure) and O&S (maintaining current force structure) in a range of funding environments. The model is also capable of exploring more explicit tradeoffs within limited acquisition categories. The procurement decision algorithm strives to maintain the 'shape' of the force (relative numbers of various platform types) in the event that budgets are inadequate to meet the stated goals. A separate but related macroeconomic model capable of generating a range of future Navy funding streams was also developed under this effort. The DIBS model has been successfully demonstrated (FY93), and previous versions of NFAM have supported a variety of studies. Proposals have been submitted for further development and enhancements. NCCA-27 is related to this project.

Classification: Database—Secret; Model—Unclassified

Sponsor: Chief Naval Operations (Code N812)
The Pentagon
Washington, DC 20310
Matt Henry, (703) 697-5242
ASN (RDA) Acquisition Reform Office
Michael D. Roberts, (703) 602-5506

Performer: Carderock Division, Naval Surface Warfare Center (Code 21)
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Michael F. Jeffers, Jr., (301) 227-1941; DSN: 287-1941
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Naval Surface Warfare Center (Code A50), Dahlgren Division
Dahlgren, VA 22448-5000
Eric Rocholl, (540) 653-5236, DSN: 249-5236

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|-----------|----------------|--------------------|
| Prior FY | | \$390,000 | 2.5 | 97 | \$0 | 0 |
| 96 | | \$0 | 0 | 98 | \$50,000 | 0.3 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|---|
| | Feb 93 | TBD |
| | Nov 93 | DIBS Prototype |
| | Apr 95 | DIBS Enhancements |
| | Sep 95 | New Relationships, Excel 5.0 (both NFAM and DIBS) |
| | Mar 98 | New NFAM, combines old NFAM and DIBS |

Data Base: *Title:* NFAM Data Base
Description: Model contains a force structure database derived from the SASDT and Ship Management Information System, O&S cost factors derived from VAMOSC-Ships/Air, maintained in Excel. To remain current, databases are periodically updated.
Automation: Microsoft Excel Spreadsheet
Publications: Draft reports of DIBS model and operation. Relationships documented in briefing form.
Category: II.A
Keywords: Government, Analysis, Policy, Programming, Budgeting, Weapon Systems, Life Cycle, Acquisition Strategy, Risk/Uncertainty, Mathematical Modeling, Statistics/Regression, Mathematical Model, Computer Model

NSWCCD-5

Title: Nuclear Attack Submarine Technology-Based Parametric Cost Model
Summary: The objective of this project was to develop a technology-driven life cycle cost model for nuclear attack submarines. The model provides feedback on how a technology (or group of technologies) affects total life cycle cost based upon engineering judgement of performance, weight and cost impacts. Using the previously developed nuclear attack submarine, performance-based parametric cost model, this project integrated the performance-based analysis with 6.2 Submarine Technology analysis of component-level technology goals. The resulting model is a tool for providing quick ROM cost estimates of submarine system concepts that include new technology options. The FY96 version of this model was limited to structural systems technologies and their effect on procurement cost. The model development plan called for the ability to assess the life cycle cost effects of technologies related to structural systems, signature control, maneuvering and seakeeping, and power and automation. No funding was received in FY97 to complete development of the model.

Classification: Business Sensitive

Sponsor: Carderock Division, Naval Surface Warfare Center
 9500 MacArthur Boulevard
 West Bethesda, MD 20817-5700
 Dr. Kihan Kim, (301) 227-1378; DSN: 287-1378

Performer: Carderock Division, Naval Surface Warfare Center (Code 21)
 9500 MacArthur Boulevard
 West Bethesda, MD 20817-5700
 Bethesda, MD 20084-5000

Marc Greenberg, (301) 227-4716; DSN: 287-4716; Robert R. Jones; Dr. Stuart Ullman

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 96 | \$150,000 | 1 |
| | 97 | \$0 | 0 |

Schedule: Start End
 Apr 96 Sep 97

Data Base: *Title:* None

Description: Historical summary of the technical characteristics of nuclear attack submarine structural systems

Automation: Microsoft Excel Spreadsheet

Publications: *Development of the Submarine Technology Assessment Cost Model (SUBTACM), CARDEROCKDIV NSWCCD/TSS-97-015, September 1997*

Category: II.B

Keywords: Government, Analysis, Ships, Concept Development, Life Cycle, Manufacturing, Advanced Technology, Risk/Uncertainty, Size, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Mathematical Model, Computer Model

NSWCCD-6

Title: Analysis of Operation and Support (O&S) Costs for Aircraft Carriers

Summary: The objective of the project is to evaluate Organizational and Intermediate aircraft carrier O&S cost data and develop cost estimating relationships that will support costs estimates required for the acquisition and design of aircraft carriers. The data and resulting analysis will be used to assist the design community in trade-off studies of technology. The study will improve understanding of the composition of aircraft carrier O&S costs. The analysis will identify cost drivers (with the ability to rank order the drivers by 1, 2, and 3-digit levels of the SWBS), develop cost estimating relationships, and improve methodologies for estimating costs by compiling and documenting statistical or engineering models. FY 99 efforts will aim at expanding the O&S modeling to reflect changes in future maintenance planning, e.g., proposed life cycle plans, and work towards achieving aircraft carrier Total Ownership Cost reduction goals. The work will be coordinated with the program office execution plan for CAIV and TOC metrics. The work will support the CVX FY 99 Milestone I review and the ship requirements definition process.

Classification: Business Sensitive

Sponsor: Naval Sea Systems Command (SEA 01712)
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Arlington, VA 22242-5160
Steve Moretto, (703) 413-4913/4950

Performers: PERA CV
1305 Ironsides Drive
Bremerton, WA 98310
Ken Dieter, (360) 476-4791
Carderock Division, Naval Surface Warfare Center,
Philadelphia, PA 19112
Tim Klingersmith, (215) 897-1076

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$600,000 | 4 |
| | 99 | \$600,000 | 4 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 98 | Oct 99 |

Data Base: The data base will consist of Intermediate, Organizational and Depot-Level Aircraft Carrier O&S cost data organized at the 1, 2, 3 and selected 4 and 5-digit levels of the Expanded Ship Work Breakdown Structure (ESWBS).

Publications: None

Categories: II.A.1, II.A.2, II.B, II.C, II.D

Keywords: Government, Estimating, Analysis, Ships, Production, Labor, Operations and Support, Statistics/Regression, Study, CER

Title: Aircraft Carrier Performance-Based Life Cycle Cost Model and Present Value Analysis Modeling

Summary: The Carrier performance-based life cycle cost model (PBCM) is being developed in an evolutionary fashion. The FY 98 effort focused on a "pre-prototype" or screening version of the model that estimates procurement costs based on high-level descriptors of (a) performance requirements and (b) system definition. This pre-prototype model served as an initial proof of concept design to assess the feasibility of proceeding to more comprehensive and detailed PBCM. FY99 efforts will concentrate on successful completion and acceptance of the pre-prototype procurement model then expanding the model to estimate the entire life cycle cost impact of a performance feature, i.e., R&D and operating and support, and disposal costs. The model will be used for the CVX Requirements definition process and development of estimates in support of the planned FY 99 Milestone I review. The PBLCCM will aim to: (1) facilitate the development of cost estimates which address the application of technological improvements in the ship design, (2) provide quick ROM cost estimates of aircraft carrier design options, and (3) to investigate the cost implications of survivability enhancements.

The Present Value Analysis Modeling (Cost Benefit Analysis Model) will provide a common analysis technique for assessing the benefits versus costs of design improvements and technology application or insertion for aircraft carrier programs. The FY 98 effort focused on modeling the entire life cycle to provide a total ownership cost perspective. The FY 99 effort will expand the technique for assessment of individual technology impacts or individual design option impacts. The analysis will include estimates of the life cycle costs for all ships of the Nimitz Class including the CVN 77 and the planned CVX class of carriers. The model overlays CVX life cycle costs on the Nimitz profile for various affordability scenarios. The cash flow analysis can reflect user-specified acquisition requirements. Cash flows may be represented by the total life cycle cost or one or more of the five major life cycle cost elements: Manpower, Maintenance, Production, Mid-life Overhaul and Disposal. The cost benefit model can be used to illustrate the life cycle cost scenarios of CVX as compared to a baseline Nimitz Class ship to enable affordability assessments. The model performs cost-benefit analyses, e.g. investment vs. net present value savings estimates, by estimating discounted "cost avoidance" of the more affordable CVX design against the discounted investment outlays required to achieve "cost avoidance." The current model provides a top-down perspective of carrier life cycle cost categories, cost drivers and cost objectives. FY 99 effort will expand the model to better reflect program objectives, e.g. RDT&E proposed in the current POM NALG, proposed life cycle profiles for future carrier maintenance, requirements determination process in development of the IRD/ORD, design and acquisition strategy trade-off studies, etc.

Both of the above tools will be utilized as tools to assist in the CAIV and TOC metrics analysis for carrier programs.

Classification: Classified/Business Sensitive

Sponsor: Naval Sea Systems Command (SEA 017)
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Performer: Carderock Division, Naval Surface Warfare Center (Code 21)
9500 MacArthur Boulevard
West Bethesda, MD 20817-5700

Marc Greenberg, (301) 227-4716; DSN: 287-4716; Robert R. Jones; Mike Jeffers;
Christine Whitacre; Dan Platt; Kim Howard

Resources: FY Dollars Staff-years
 97 \$65,000 0.5
 98 \$470,000 3.0

Schedule: Start End
 Dec 96 Sep 97
 Dec 97 Dec 98

Data Base: Title: None
 Description: Aircraft carrier, LHA, and LHD cost, weight, and performance
 Automation: Microsoft Excel Spreadsheet

Publications: None to date

Category: II.B

Keywords: Government, Analysis, Ships, Concept Development, Life Cycle, Manufacturing,
 Risk/Uncertainty, Size, Data Collection, Mathematical Modeling, Statistics/Regression,
 Data Base, Mathematical Model, Computer Model

NSWCCD-8

Title: Arsenal Ship Operating and Support Cost Model

Summary: As part of the source selection support effort, an operating and support cost model was developed. This model was intended to be sensitive to particular Arsenal Ship issues such as reduced manning levels and maintenance concepts outside standard Navy procedures. Effort on this model ceased in FY97.

Classification: Business Sensitive

Sponsor: Arsenal Ship Joint Project Office
 7100 Fairfax Drive
 Arlington, VA

 Mr. Dave Schwiering, (703) 527-9206

Performer: Carderock Division, Naval Surface Warfare Center (Code 21)
 9500 MacArthur Boulevard
 West Bethesda, MD 20817-5700

 Michael F. Jeffers, (301) 227-1941; DSN: 287-1941; Christine Whitacre; Robert R. Jones

Resources: FY Dollars Staff-years
 97 \$225,000 1.5

Schedule: Start End
 Sep 96 Oct 97

Data Base: Title: None
 Description: Operating and support cost
 Automation: Microsoft Excel Spreadsheet

Publications: None to date

Category: II.B

Keywords: Industry, Government, Analysis, Ships, Operations and Support, Training, Readiness, Reliability, Sustainability, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Mathematical Model, Computer Model

NSWCCD-9

Title: Aircraft Carrier Cost-Benefit Analysis Model

Summary: The effort will gather ship cost data on CVX development efforts and determine the ROI on the total ownership cost for numerous system level concepts at various levels of the Aircraft Carrier work break-down structure.

Sponsor: Naval Sea System Command (SEA 01712)
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Performer: Tecolote Research, Inc.
1700 N. Moore Street, Suite 1400
Rosslyn Center Office Building
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1305 Ironsides Drive
Bremerton, WA 98310
Ken Dieter, (360)476-4791

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$570,000 | 3.0 |
| | 99 | \$500,000 | 3.5 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Dec 98 | Dec 99 |

Data Base: *Title:* None
Description: Current SEA017 Aircraft carrier life cycle cost estimates
Automation: Microsoft Excel Spreadsheet

Publications: None to date

Category: II.B

Keywords: Government, Analysis, Ships, Concept Development, Life Cycle, Manufacturing, Risk/Uncertainty, Size, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Mathematical Model, Computer Model

Title: USCG Performance-Based Life Cycle Cost Model

Summary: The objective is to develop a cost model sensitive to high-level performance parameters for predicting the Life Cycle Cost (LCC) of U.S. Coast Guard (USCG) ship designs. The resulting model is envisioned as a tool to provide quick ROM cost estimates of USCG ship concepts, including icebreakers, high endurance cutters, and medium endurance cutters, during the early stages of ship concept development. This effort is scheduled for completion by the end of FY98.

Classification: Unclassified

Sponsor: United States Coast Guard Engineering Logistics Center (ELC023)
2401 Hawkins Point Road
Baltimore, MD 21226-5000
Mr. Martin Hecker, (410) 762-6706

Performer: Carderock Division, Naval Surface Warfare Center (Code 21)
9500 MacArthur Boulevard
West Bethesda, MD 20817-5700
LCDR Michel J. Guerard, (301) 227-3627

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$104,100 | 0.70 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Mar 98 | Dec 98 |

Data Base:

| | |
|---------------------|--|
| Title: | None |
| Description: | Cost information for USCG icebreakers, high endurance cutters, medium endurance cutters, and for U.S. Navy oceanographic ships |
| Automation: | None |

Publications:

Categories: II.A.2, II.D

Keywords: Government, Estimating, Analysis, Electronics/Avionics, Concept Development, Demonstration/Validation, Labor, Material, Overhead/Indirect, Data Collection, Statistics/Regression, CER, Data Base, Method, Computer Model

AIR FORCE COST ANALYSIS AGENCY

| | | | |
|-----------------|---|--------------------------------|--|
| Name | Air Force Cost Analysis Agency | | |
| Address | 1111 Jefferson Davis Highway Suite 403 Arlington, VA 22202-4306 | | |
| Director | Mr. Joseph T. Kammerer, (703) 697-5312 | | |
| Size | Professional: | 63 (authorized); 51 (assigned) | |
| | Support: | 2 | |
| | Consultants: | — | |
| | Subcontractors: | — | |
| Focus | | | |
| Activity | Number of projects in process: | 9 | |
| | Average duration of a project: | 1 year | |
| | Average number of staff members assigned to a project: | 1 | |
| | Average number of staff-years expended per project: | 0.2 | |
| | Percentage of effort conducted by consultants: | 75% | |
| | Percentage of effort conducted by subcontractors: | 0% | |

AFCAA-1**Title:** NAFCOM**Summary:** The project develops and integrates specific AF requirements into the database and NASA Cost Model. The incorporation of AF requirements allows data and cost estimates to be displayed, analyzed, and used in a manner compatible with AF terminology and costing procedures. Phase II includes incorporating Air Force specific cost drivers into the Complexity Generator development process. Phase III will incorporate phasing, risk analysis, and further generation of complexity factors from Phase II. A Phase IV is anticipated.**Classification:** Unclassified**Sponsor:** Air Force Cost Analysis Agency, Research Division
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
E-mail: plumer@af.pentagon.mil**Performer:** SAIC

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| Phase I | 96 | \$150,000 | |
| Phase II | 97 | \$150,000 | |
| Phase III | 98 | \$150,000 | |
| Phase IV | 99 | TBD | |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| Phase I | | Complete |
| Phase II | | Complete |
| Phase III | Nov 97 | Nov 98 |
| Phase IV | Nov 98 | Nov 99 |

Data Base: NAFCOM Database**Publications:** Normalized Database and NAFCOM Documentation**Category:** II.A.2**Keywords:** Government, Estimating, Space Systems, Analysis, Life Cycle, Spares/Logistics, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Computer Model**AFCAA-2****Title:** Crosslinks Payload Data Collection and CER Development**Summary:** This project involves the data collection on crosslink payloads and the development of cost estimating relationships (CERs). Data collection will involve the collection of past and current crosslinks. The data collected will be consistent with the NASA/AF standard WBS and standard normalization procedures. It will provide the database to develop CERs and cost estimating crosschecks.**Classification:** TBD**Sponsor:** Air Force Cost Analysis Agency, Research Division
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
E-mail: plumer@af.pentagon.mil**Performer:** TBD

Resources: FY Dollars Staff-years
 99 TBD

Schedule: Start End
 Oct 98 Oct 99

Data Base: TBD

Publications: TBD

Category: II.A.2

Keywords: Government, Estimating, Analysis, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

AFCAA-3

Title: Missiles ACDB Update

Summary: The objective of this project is to collect the necessary data to perform periodic updates of the Automated Cost Data Base (ACDB) to include 665 CCDD reports on missile programs. These updates require a second phase to conclude data entry and additional new reports.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
 Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394
 E-mail: obrien@af.pentagon.mil

Performer: Tecolote Research, Inc.

Resources: FY Dollars Staff-years
 Phase I 97 \$165,000
 Phase II 98 \$100,000
 Phase III 99 TBD

Schedule: Start End
 Phase I May 97 Apr 98
 Phase II Apr 98 Oct 98
 Phase III Oct 98 Oct 99

Data Base: *Title:* Missile Automated Cost Data Base (ACDB)
Description: Missiles and Munitions systems data
Automation: PC in FoxPro

Publications: TBD

Category: II.A.1

Keywords: Government, Analysis, Programming, Forces, Mathematical Modeling, Computer Model, Life Cycle, Labor, Material, Data Collection, Data Base, Missiles

AFCAA-4

Title: Below-the-Line Cost Study for Missiles and Munitions

Summary: This project involves a comprehensive effort to update the below-the-line cost research study completed by Tecolote in 1994. Although the study as it stands now has been useful, the most recent cost data is from 1990. The effort will involve retrieving the most

recent cost data points from the ACDB Tri Service Missile and Munitions database and performing analysis to update and add new CERs to the original study. This effort will include narratives of the CER development including graphs and summary statistics as well as detailed spreadsheets with raw and normalized data. In addition during the course of analysis, if any new below the line costs are discovered that are not in ACDB then these data points would then be added to the missile database.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394
E-mail: obrien@af.pentagon.mil

Performer: Tecolote Research Inc.

Resources: FY Dollars Staff-years
99 TBD

Schedule: Start End
Oct 98 Oct 99

Data Base: TBD

Publications: Updated final report showing all relevant analysis and CERs

Category: II.A.2

Keywords: Government, Estimating, Analysis, Weapon Systems, Missiles, Life Cycle, Training, Data Collection, CER, Data Base

AFCAA-5

Title: Weapon System Cost Growth Study

Summary: This in-house research project is currently taking a look at updating the weapon system cost growth study conducted by SAF/FMC in 1989. This study will not only look at aircraft systems but will include missile system cost growth at each milestone. The principle means to conduct this effort has been through analysis of historical SAR reports by examining the cost growth for the 100th unit for aircraft and the 1000th unit for missiles. Analysis is also being conducted to see if there is a relationship between development time and unit cost including flying hour costs. This analysis portion is anticipated for Phase II. The final briefing will include narratives explaining some of the reasons for the cost growth in each of the systems.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
E-mail: plumer@af.pentagon.mil

Performer: Phase I: Air Force Cost Analysis Agency
Phase II: TBD

Resources: FY Dollars Staff-years
Phase I: 98 In-House
Phase II: 99 TBD

Schedule: Start End
Phase I: Jan 98 Oct 98
Phase II: Oct 98 Oct 99

Data Base: Excel files

Publications: Final briefing report showing summary of analysis
Category: II.A.2
Keywords: Government, Estimating, Analysis, Weapon Systems, Aircraft, Missiles, EMD, Production, Life Cycle, Manufacturing, Schedule, Labor, Material, Overhead/Indirect, Data Collection, CER, Data Base

AFCAA-6

Title: Below-the-Line In-House Cost Research Study
Summary: This in-house research project is currently taking a look at collecting below the line costs including SEPM, Data, Training, STE etc for aircraft systems, launch complex activation, and airborne radar. The aircraft portion of the study includes top level summaries by all aircraft types as well as factors by platform type including fighters, bombers, trainers, and cargo transport aircraft. This study will be unique in that it not only breaks out below-the-line costs by EMD and Production but it also examines factors by production lot. This analysis will include detailed spreadsheets and show both raw and normalized data.
Classification: Unclassified
Sponsor: Air Force Cost Analysis Agency, Research Division
 Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
 E-mail: plumer@af.pentagon.mil
Performer: Air Force Cost Analysis Agency
Resources: FY Dollars Staff-years
 98
Schedule: Start End
 Sep 97 Aug 98
Data Base: TBD
Publications: Summary report and spreadsheets showing analysis completed
Category: II.A.2
Keywords: Government, Estimating, Analysis, Weapon Systems, Aircraft, Missiles, Space Systems, EMD, Production, Life Cycle, Manufacturing, Schedule, Labor, Material, Overhead/Indirect, Data Collection, CER, Data Base

AFCAA-7

Title: Multi-Aircraft Database Normalization
Summary: The objective of this project is to normalize and fully document previously collected Air Force and Navy cost and technical data. The database will be flexible enough to allow for either an analogy-based or CER-based approach for both recurring and non-recurring costs of aircraft systems. The database will contain functional hourly and cost information as well as technical information for each hardware WBS element. Sources of data and normalization rationale will be completely documented. This project is a continuation of a research effort undertaken with FY 93 funds.
Classification: Unclassified
Sponsor: Air Force Cost Analysis Agency, Research Division
 Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394
 E-mail: obrien@af.pentagon.mil

Performer: Phase I RAND
Phase II Tecolote Research Inc.
Phase III Naval Air Systems Command

Resources:

| | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|-----------|----------------|--------------------|
| Phase I | 93 | \$100,000 | |
| Phase II | 96 | \$225,000 | |
| Phase III | 97 | \$25,000 | |

Schedule:

| | <u>Start</u> | <u>End</u> |
|-----------|--------------|------------|
| Phase I | Complete | |
| Phase II | Complete | |
| Phase III | Apr 98 | Oct 98 |

Data Base: TBD

Publications: TBD

Categories: I.B, I.D, II.A, II.B

Keywords: Government, Analysis, Estimating, Aircraft, Airframe, EMD, Production, Labor, Material, Data Collection, Data Base

AFCAA-8

Title: Price H Composite Material Calibration

Summary: This project will develop normalized Price H calibrations for aircraft composite fabrication processes and techniques. This calibration will be based on actual manufacturing data and experience. The effort will analyze and calibrate different composite materials and processes such as hand lay-up or machine lay-up techniques across different contractors. The final product will include narrative of the information collected as well as actual and normalized cost data with a user friendly means to calibrate the Price H model for the various input parameter settings.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
E-mail: plumer@af.pentagon.mil

Performer: Price

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 99 | TBD | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct 98 | Oct 99 |

Data Base: TBD

Publications: Summary report and Price H Calibration results

Category: II.A.2

Keywords: Government, Estimating, Analysis, Weapon Systems, Aircraft, EMD, Production, Life Cycle, Manufacturing, Labor, Material, Advanced Technology, Data Collection, CER, Data Base, Mathematical Modeling

AFCAA-9

Title: Aircraft Database Study Follow-On

Summary: Collect, analyze, and organize historical cost data for the following aeronautical programs B-2 and C-5 .

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394
E-mail: obrien@af.pentagon.mil

Performer: Tecolote Research Inc.

Resources: FY Dollars Staff-years

Schedule: Start End
Oct 98 Oct 99

Data Base: TBD

Publications: TBD

Category: II.A

Keywords: Government, Estimating, Analysis, Life Cycle, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Computer Model

AFCAA-10

Title: Avionics Systems Data Collection

Summary: The objective of this effort is to update/develop a historical avionics database to allow analysts to better understand and apply the data during subsequent cost estimating relationship (CER) development. Cost, technical, and programmatic data from the population of U.S. military weapons with on-board avionics systems, including those with integrated avionics architecture (vice federated) will be collected. The data will be validated and normalized. Sources of data, validation efforts, and normalization rationale will be completely documented.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
E-mail: plumer@af.pentagon.mil

Performer: TBD

Resources: FY Dollars Staff-years
99 TBD

Schedule: Start End
Oct 98 Oct 99

Data Base: TBD

Publications: TBD

Categories: I.B.1, I.C.1, II.B

Keywords: Government, Analysis, Electronics/Avionics, EMD, Production, Labor, Material, Data Collection, Data Base

AFCAA-11

Title: Overhead Study

Summary: The objective of this project is to provide a primer discussing methods of measuring and predicting business base changes for a prime weapon system contractor; then describing how to calculate alternate overhead rates given different assumptions of that contractor's future business base. This effort will allow normalization of current WRAP rates to the historical data underlying an estimate; it will also allow normalization of the historical cost data to reflect current WRAP rate calculations. Phase II will include additional contractor sites.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394
E-mail: obrien@af.pentagon.mil

Performer: Naval Air Systems Command

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| Phase I | 97 | \$160,000 | |
| Phase II | 98 | TBD | |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| Phase I | Oct 97 | Oct 98 |
| Phase II | Oct 98 | Oct 99 |

Data Base: Excel

Publications: Stand-alone documentation on each contractor site.

Categories: I.B, II.A, II.B

Keywords: Government, Analysis, Estimating, Aircraft, Production, Labor, Material, Data Collection, Data Base

AFCAA-12

Title: Long Range Planning O&S Cost Models

Summary: This project will fulfill a tasking from SAF/FM to provide top-level system cost modeling in support of AF/XOX and the Air Force Corporate Structure to develop a database of operations and support models that an analyst can use to swiftly model current and future force structure alternatives. These O&S models will be built in Excel and provide a rough-order-of-magnitude modeling of O&S costs for the majority of Air Force weapon systems in the inventory as well as many futuristic systems. The completed database will allow the analyst to rapidly produce a series of ROM cost estimates based on the force structure scenarios the customer provides.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
E-mail: plumer@af.pentagon.mil

Performer: TASC

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 98 | \$150,000 | |

Schedule: Start End
 Jan 97 Sep 98

Data Base: Excel Spreadsheets

Publications: Summary report and O&S spreadsheets showing analysis completed

Category: II.A.2

Keywords: Government, Estimating, Analysis, Weapon Systems, Aircraft, Missiles, Space Systems, EMD, Production, Life Cycle, Data Collection, CER, Data Base

AFCAA-13

Title: Integrated Force and Infrastructure Cost Model (IFICM)

Summary: IFICM is an organizationally-based simulation of the total Air Force structure. It will be designed to provide decision-makers insight into how changes in force and basing structure will effect support and infrastructure costs. This model takes a unique approach estimating support and infrastructure costs by modeling the Air Force base structure at wing level. Wing and squadron level cost and manpower requirements, by PE and appropriation, are estimated from CER and planning factors unique to the weapon system based at each location. Requirements are accumulated through the various organizational levels to a total AF TOA roll-up with links to supporting infrastructure organizations such as logistics, training, and recruiting which generate other related costs and capacity metrics. The model output is intended to be used in mid- and long-range planning exercises in support of MAP, QDR, DPP, and BRAC type initiatives.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
 Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
 E-mail: plumer@af.pentagon.mil

Performer: TBD

Resources: FY Dollars Staff-years
 99 TBD

Schedule: Start End
 Phase I Oct 98 Oct 99
 Phase II Oct 99 Oct 00

Data Base: TBD

Publications: TBD

Categories: II.B, II.C

Keywords: Government, Analysis, Forces, Infrastructure, Acquisition Strategy, Automation, Data Collection, Method

AFCAA-14

Title: Force Analysis Decision Support System ACEIT Enhancements

Summary: The objective of this effort is to provide enhancements to ACEIT to facilitate Force Costing and budget analysis. This effort will provide a general-purpose framework for combining weapon system cost estimates at a summary level into an integrated budget analysis utility. This framework will support top level yearly budget drills and will assist with analysis of alternative Force mixes. In addition, it will enhance the utility of ACEIT

by improving the integration of ACEIT with other Windows applications. Enhancements will be made to the ACEIT Executive to provide more flexibility with using ACE sessions from within Excel. To the extent funding is available, other specific enhancements will be made to CO\$TAT and ACE.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Research Division
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128
E-mail: plumer@af.pentagon.mil

Performer: Tecolote

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$190,000 | |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | May98 | May99 |

Data Base: Product updates shall be included in scheduled ACEIT releases to ensure proper integration between multiple ACEIT development efforts and to reduce distribution expenses.

Publications: Updates to User's Guides may be distributed in electronic or paper format, as required.

Category: II.A.2

Keywords: Industry, Government, Estimating, Analysis, Weapon Systems, Life Cycle, Method, Computer Model

AFCAA-15

Title: Air Force Total Ownership Cost (AFTOC)

Summary: AFTOC is projected to expand upon the Visibility and Management of Operating and Support Costs (VAMOSOC) database. Phase I of this effort focuses on having direct costs for aircraft systems only on-line by Apr 98. It also includes the addition of selected Space and Missile Systems along with aircraft component level data by Jul 98. Finally, Phase I will add aircraft indirect cost by Sep 98. Phase II involves the addition of costs for the remaining Space, Missile, AIS, and C4I Systems.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency, Force Analysis Division
Ms Wendy Kunc, (703) 604-0415; DSN: 664-0415
E-mail: kuncw@af.pentagon.mil

Performer: TASC and Battelle

| | | | | |
|-------------------|----------|-----------|----------------|--------------------|
| Resources: | | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | Phase I | 98 | \$425,000 | |
| | Phase II | 99 | \$490,000 | |

| | | | |
|------------------|----------|--------------|------------|
| Schedule: | | <u>Start</u> | <u>End</u> |
| | Phase I | Dec 97 | Sep 98 |
| | Phase II | Oct 98 | Sep 99 |

Data Base: TBD

Publications: TBD

Categories: II.A.2, II.C

Keywords: Government, Reviewing/Monitoring, Aircraft, Space Systems, Missiles, Operations and Support, Labor, Material, Data Collection, Data Base

AFCAA-16

Title: ACEIT Upgrades / RISK Integration

Summary: Update of ACEIT cost estimating software to improve cost estimate accuracy and cost estimator productivity. Our mission is to perform cost estimates in support of weapon system major milestone decisions. This tool enables our agency to prepare and document our cost estimates more effectively. This project specifically upgrades the Windows version of ACEIT and improves phasing, speed, documentation, COSTAT statistics, and the incorporation of the RISK module into ACEIT. Follow-on efforts are yet to be determined.

Classification: Unclassified.

Sponsor: Air Force Cost Analysis Agency, Research Division
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394
E-mail: obrien@af.pentagon.mil

Performer: Tecolote Research, Inc.

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------------------|-----------|----------------|--------------------|
| Past Improvements: | 93-5 | \$646,000 | |
| Current Improvements: | 96-7 | \$410,000 | |
| Follow on Efforts: | 99 | TBD | |

| Schedule: | <u>Start</u> | <u>End</u> |
|-----------------------|--------------|------------|
| Current Improvements: | Jan 97 | Sep 98 |
| Follow on Efforts: | Oct 98 | Oct 99 |

Data Base: N/A

Publications: ACE IT user manuals and supporting documentation

Categories: II.A.2, II.B

Keywords: Industry, Government, Estimating, Analysis, Weapon Systems, Life Cycle, Method, Computer Model

**AERONAUTICAL SYSTEMS CENTER,
AIR FORCE MATERIEL COMMAND**

| | | |
|-----------------|--|--------|
| Name | Aeronautical Systems Center, Air Force Material Command Cost Division, Comptroller Directorate | |
| Address | ASC/FMC Bldg. 14, Rm. 152 1865 4 th Street Wright-Patterson AFB, OH 45433-7123 | |
| Director | Ms. Kathy A. Ruffner, (937) 255-6483 | |
| Size | Professional: | 38 |
| | Support: | 4 |
| | Consultants: | 0 |
| | Subcontractors: | 0 |
| Focus | Cost Estimating and Research, Resources Analysis (Source Selection Policy and Estimates) Scheduling, Earned Value Management and Performance Measurement, Integrated Risk Management, and Support of Analysis of Alternatives. | |
| Activity | Number of projects in process: | 6 |
| | Average duration of a project: | Varies |
| | Average number of staff members assigned to a project: | 1 |
| | Average number of staff-years expended per project: | .33 |
| | Percentage of effort conducted by consultants: | — |
| | Percentage of effort conducted by subcontractors: | 66% |

ASC/FMC-1

Title: Advanced Aircraft Cost Forecasting Model (AACFM)

Summary: This model primarily estimates life cycle costs in an early system environment. It is similar to PRICE in estimating systems and major subsystems. However, it includes unique O&S and risk cost modeling features. The database is currently unclassified, but it is easy to populate with classified data by the end user. The model includes a published paper, briefing, and a user's guide. AACFM is hosted in Microsoft Access 2.0 and runs on Windows 3.1. The model requires at least a 486 personal computer with at least 8 megabytes of random access memory (RAM) to run efficiently.

Classification: Unclassified

Sponsor: ASC/XRPC
Mr. Patrick Cyrus, (937) 255-6262

Performer: Ms. Helen Scratt
President Econ, Inc.
18685 Main Street (A401)
Huntington Beach, CA 92648
Phone: (714) 596-9938
Fax: (714) 596-9249
Email: Econwest@AOL.COM

Mr. Robert Phillips
Vice-President Econ, Inc.
711 West Bay Area Blvd.
Webster, TX 77598
Phone: (281) 554-7592
Fax: (281) 554-4481
Email: Econwest@AOL.COM

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98-00 | \$745,542 | 0 |
| | (Phase IIA&B) | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Jan 94 | Jan 96 |

Data Base:

System Level: Program go-ahead data, First Flight date, Year of Initial Operating Capability (IOC), Number of Test Aircraft, Number of Production Aircraft, State of the Art, Base Complexity, Complexity Growth, Calculated Complexity, Weight Specification or Operating Environment, Integration Factors (EMD, Production), Base year.

Hardware Level: Number of engines per aircraft, Aircraft empty weight, Subsystem state-of-art rating, Subsystem operating environment, 100th unit cost.

Software Level: Software Complexity, Software function, Percent new design, Number of lines of code, Software certification level, Operating environment, Composite hourly rate for labor.

Integration: Development integration complexity, Production integration complexity.

Publications: Draft user manual and briefing

Category: II.B

Keywords: Government, Estimating, Electronics/Avionics, Weapon Systems, Life Cycle, Engineering, Manufacturing, Mathematical Modeling

ASC/FMC-2

Title: Automated Model for Integrating Cost with Operational Effectiveness

Summary: This Phase 2 contractual effort is to create a PC based tool to integrate cost and operational effectiveness analysis. The model uses optimal technique algorithms to determine outcome and cost as force mix is changed. PHASE 2 focuses on four primary activities—developing linkage models for BRAWLER and other engineering/engagement models in use by ASC/XR. Optimization algorithms will be integrated with BRAWLER, cost models and linkage models to allow new designs to be specified to maximize performance for a given cost. Existing cost models will be augmented with an aircraft integration model and a modified operating and support model. Software will be developed to interface a PC with the user for cost presentations and for optimization input/output.

Classification: Unclassified

Sponsor: ASC/XRPC
Mr. Patrick Cyrus, (937) 255-6262

Performer: Technomics, Inc. (Prime)
5290 Overpass Road, Suite 206
Santa Barbara, CA 93111
Mr. Eugene Waller
Mr. John Horak, (805) 964-9894
Toyon Research Corporation (Subcontractor)
75 Aero Camino, Suite A
Goleta, CA 93117-3139
Mr. Mark T. Fennell, (805) 968-6787 ext. 158

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|--------------|------------------|--------------------|
| 98-00(Prime) | \$441,470 | 0 |
| (Sub) | <u>\$275,002</u> | |
| | \$716,472 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Aug 97 | Aug 99 |

Data Base: System LEVEL: Number of test aircraft, number of production aircraft, and first flight data.
Hardware LEVEL: A/C unit weight, material complexity, supersonic or subsonic, maximum engine trust, turbine inlet temperature
Software LEVEL: Source lines of code, Source lines of reused code, SW Language, Labor Rate, Specific application or types of application
Aircraft Integration: Types of platform, Installed weight, Removed weight, Type of modification, # of Cables

Publications: Software disc & documentation, user manual, final report and briefing

Category: II.B

Keywords: Government, Estimating, Electronics/Avionics, Weapon Systems, Life Cycle, Engineering, Manufacturing, Mathematical Modeling

ASC/FMC-3

Title: PRICE Model Calibration Studies

Summary: The F-15 System Program Office is sponsoring PRICE Model calibration efforts for their program. The F-15 study will look at aircraft integration associated with various modification efforts in support of enhancing the use of the PRICE H and PRICE S model.

Classification: Unclassified

Sponsor: ASC/FMCE
Mr. Scott DeBanto, (937) 656-5483

Performer: Lockheed Martin PRICE SYSTEMS

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$79,930 | 0 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Nov 97 | Oct 98 |

Data Base:

| | |
|---------------------|---|
| Title: | PRICE Model Aircraft Calibration Database |
| Description: | F-15 Data |
| Automation: | Access |

Category: II.A

Keywords: Government, Estimating, Analysis, Weapon Systems, Aircraft, EMD, Production, Engineering, Manufacturing, Integration, Modification, Data Collection, Computer Model

ASC/FMC-4

Title: Integrated Desktop Analysis and Planning System (IDAPS) Concept Evaluation (ICE)

Summary: The Integrated Desktop Analysis and Planning System (IDAPS) Concept Evaluation (ICE) system was sponsored by ASC/XR and created by Frontier Technology, Inc. It is an integrated environment that is a concept cost analysis tool that enables concept evaluation and total system life-cycle cost analysis. The system does this by integrating approved cost models, CORE, DLR and SEER. Incorporation of additional models is being worked. (Note that to use current ICE, one needs access to SEER-SEM version 4.6.8 and SEER-H version 3.7.6 software licenses.) Minimal PC requirements are a 486 or higher platform running Windows 3.1.1, Windows 95 or Windows NT operating systems.

Classification: Unclassified

Sponsor: ASC/XRI
Mr. Bert Turner, (937) 255-3164, ext. 3016

Performer: Frontier Technology, Inc.
4141 Col Glenn Highway, Suite 140
Beavercreek, OH 45431
Phone: (937) 429-3302, ext. 22
E-mail: rshroder@fti-net.com

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| | | |

Schedule: Status is Complete

Publications: Training Manual Documentation is available

Category: II.A

Keywords: Government, Analysis, Life Cycle, Computer Model

ASC/FMC-5

Title: Case Study, APG-63 V(1) Radar, F-15

Summary: The objective of this study is to examine the entire APG-63 (V)1 program and identify benefits attributable to acquisition reform and other initiatives. There is substantial interest in quantifiable cost reduction realized through Acquisition Reform, but corroborating empirical evidence is scarce. Information collected during this research effort will be provided to IDA for potential inclusion in their on-going research to assess cost reduction initiatives. The APG-63 (V)1 radar program has been managed under the new acquisition environment and has completed Engineering & Manufacturing Development (EMD) within performance, schedule, and budget. The program entered Low Rate Initial Production (LRIP) in Aug 97.

Classification: Unclassified/Proprietary Information

Sponsor: ASC/FMCE
Wright-Patterson AFB, OH 45433-7123
Ms. Kathy Watern, (937) 656-5491

Performer: ASC/FMCE
Ms. Janet Wentworth, (937) 656-5484

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | | | .33 |

| | | |
|-------------------------|---------------------|-------------------|
| <i>Schedule:</i> | <u>Start</u> | <u>End</u> |
| | Apr 98 | Nov 98 |

Data Base: F-15 Development Support Office (DSO) APG-63 program files, ASC Cost & Schedule Data Center program cost estimates and cost performance reports, and contractor's programmatic records.

Publications: TBD

Categories: I.A, I.B.1

Keywords: Government, Industry, Estimating, Analysis, Aircraft, Electronics/Avionics, Demonstration/Validation, EMD, Acquisition Strategy, Modification, Data Collection, Case Study, Review, Study

ASC/FMC-6

Title: Avionics Support Cost Factors Update

Summary: This project is a comparison and analysis of avionics support cost factors developed in a 1988 study and current 1998 factors. These support factors include Primary Mission Equipment (PME), Systems Engineering/Program Management (SE/PM), System Test and Evaluation, Support Equipment, Data, and Training.

Classification: Unclassified

Sponsor: ASC/FMCE
Wright Patterson Air Force Base, OH
Ms. Kathy Watern, (937) 656-5491

Performer: ASC/FMCE
Mr. Don Wren, (937) 656-5496

.33

AIR FORCE SPACE AND MISSILE SYSTEM CENTER

| | | |
|-----------------|--|------------------------------|
| Name | Air Force Space and Missile System Center Cost Division | |
| Address | 2430 E. El Segundo Blvd., Suite 2010 Los Angeles AFB, CA 90245-4687 | |
| Director | Mr. Anthony E. Finefield | |
| Size | Professional: | 13 |
| | Support: | 1 (Aerospace) |
| | Consultants: | 0 |
| | Subcontractors: | 2 (EER Systems, MCR Federal) |
| Focus | | |
| Activity | Number of projects in process: | 5 |
| | Average duration of a project: | 1 year |
| | Average number of staff members assigned to a project: | 1 |
| | Average number of staff-years expended per project: | 0.3 |
| | Percentage of effort conducted by consultants: | 0 |
| | Percentage of effort conducted by subcontractors: | 99% |

AFSMC-1

Title: Hazardous Materials Disposal Cost Study

Summary: The OSD Cost Analysis Improvement Group (CAIG) is requiring all programs to include the costs of disposing of hazardous waste in their program life cycle cost estimates. Few programs have included these costs in their estimates and some do not include all of the costs. This is the fourth part of a study to define the types and magnitude of costs related to hazardous waste disposal, determine what part of the life cycle will be impacted by these costs, and provide samples/examples of program life cycle cost estimates and trade studies. This task will consist of modifying the developed handbook and training program with changes requested by AFMC to incorporate all AFMC product center information to make this a command handbook.

Classification: Unclassified

Sponsor: SMC/FMC

Performer: EER Systems, Inc.
Ms. Mary Helen Alverio, (310) 363-2882

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| prior | \$226,094 | 0.6 |
| 97-98 | \$415,000 | 0.4 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Mar 97 | Apr 98 |

Data Base: Handbook of cost methodologies for estimating the cost of environmental mitigation strategies, hazardous material cleanup, and planning for use of non-hazardous materials.

Publications: *Space and Missile Systems Center Environmental, Safety and Health Management and Cost Handbook*

Categories: I.D, II.D

Keywords: Government, Estimating, Weapon Systems, Space Systems, Aircraft, Data Collection, Life Cycle, Missiles, Environment, Method, Study

AFSMC-2

Title: Operating and Support (O&S) Database

Summary: Populate fields of database and modify automated stand-alone tool to work in windows. Database contains data that can be used for analogy estimates, calibration efforts, and CER development, and is compatible with current Air Force computer systems.

Classification: Unclassified

Sponsor: SMC/FMC

Performer: MCR Federal, Inc.
Ms. Shirley Tinkler, (310) 363-5057

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| prior | \$1,086,000 | 0.5 |
| 98 | \$70,000 | 0.1 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Apr 98 | Apr 99 |

Data Base: Title: SMC Operating and Support (O&S) Database

Description: Contains cost and technical data for O&S ground systems, remote tracking systems, and launch systems

Automation: Access

Publications: SMC O&S Database Final Report (Phase 4), OSDDB User's Manual, Space and Missile Systems Center/FMC

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Space Systems, Operations and Support, WBS, Data Base, Size, Data Collection

AFSMC-3

Title: Passive Sensor Cost Model Update

Summary: The methods for estimating space sensor payloads (passive sensors, e.g., infrared) need to be updated. Subsystems reviewed were: focal plane arrays; optical telescope assemblies; cryogenic coolers; servo electronics; gimbals and structures; star sensors; power supplies; and sensor integration, assembly and test.

Classification: Unclassified (Proprietary database separately bound)

Sponsor: SMC/FMC

Performer: EER Systems, Inc.
Aerospace Corporation
Ms. Phu Nguyen, (310) 363-0071

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| prior | \$780,000 | 0.8 |
| 98 | \$100,000 | 0.1 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Aug 98 | Aug 99 |

Data Base:

Title: Sensor Database

Description: Contains cost and technical and programmatic data by WBS at the sensor subsystem level.

Automation: EXCEL and Access

Publications: Passive Sensor Cost Model, (1997) Space and Missile Systems Center/FMC

Category: II.A.2

Keywords: Government, Estimating, EMD, Space Systems, Production, WBS, CER, Statistics/Regression, Data Base, Method, Data Collection, Survey, Electronics/Avionics

AFSMC-4

Title: Software Database

Summary: Maintained the SMC Software Database by adding new data. Modified automated stand-alone tool to work in windows. Normalized missing parameters. DoD's largest software database.

Classification: Unclassified (Proprietary and Non-Proprietary Versions)

Sponsor: SMC/FMC

Performer: MCR Federal, Inc.

Ms. Shirley Tinkler, (310) 363-5057

Resources: FY Dollars Staff-years
prior \$961,000 0.7
98 \$ 70,000 0.1

Schedule: Start End
Apr 98 Apr 99

Data Base: **Title:** SMC Software Database
Description: Contains schedule, sizing, effort, and maintenance data from space, ground, mobile, and airborne platforms.
Automation: Access

Publications: *SMC Software Database FY96 Data Collection Effort Final Report SWDB User's Manual*, Space and Missile Systems Center/FMC

Categories: II.A.1, II.A.2

Keywords: Government, Estimating, Space Systems, WBS, Data Base, EMD, Size, Data Collection, Production, Modification

AFSMC-5

Title: Unmanned Spacecraft Cost Model (USCM) Update

Summary: Update the 7th edition (1994) of the model with developing, validating, documenting new CERs, and obtaining new data points.

Classification: Unclassified (Proprietary database separately bound)

Sponsor: SMC/FMC

Performer: Aerospace Corporation
Tecolote Research, Inc.

Ms. Phu Nguyen, (310) 363-0071

Resources: FY Dollars Staff-years
prior \$1,649,000 1.1
98 \$ 120,000 0.1

Schedule: Start End
Aug 98 Aug 99

Data Base: **Title:** USMC Database
Description: Includes cost, technical, and programmatic data by WBS at the spacecraft component level.
Automation: The database is contained in Excel spreadsheets and Automated Cost Data Base (ACDB)

Publications: *Unmanned Spacecraft Cost Model*, 7th edition, Space and Missile Systems Center/FMC

Categories: II.A.2, II.B

Keywords: Government, Estimating, EMD, Space Systems, Production, WBS, CER, Mathematical Modeling, Statistics/Regression, Data Base, Method, Mathematical Model

**ELECTRONIC SYSTEMS CENTER,
AIR FORCE MATERIEL COMMAND**

| | | |
|-----------------|--|---|
| Name | Air Force Materiel Command Cost Training & Tools, Cost Division, Electronic Systems Center | |
| Address | 5 Eglin Street Hanscom AFB, MA 01731-2117 | |
| Director | Ms. Ellen Coakley, (781) 377-5226 | |
| Chief | Mrs. Margaret Weech, (781) 377-3919 | |
| Size | Professional: | 3 |
| | Support: | 2 |
| | Consultants: | 0 |
| | Subcontractors: | 0 |
| Focus | Development and fielding of cost estimating tools and databases for C ² systems. Responsible for searching out and reviewing the latest C ² cost and schedule estimating tools available from other government agencies and commercial sources and evaluating for potential use at ESC. Providing timely, quality cost estimating training to ESC analysts and assuring they are up-to-date on new methodologies, tools, estimating approaches and policies. | |
| Activity | Number of projects in process: | — |
| | Average duration of a project: | — |
| | Average number of staff members assigned to a project: | — |
| | Average number of staff-years expended per project: | — |
| | Percentage of effort conducted by consultants: | — |
| | Percentage of effort conducted by subcontractors: | — |

ESC/FMC-1

Title: Labor Analysis Process & Automated for Estimating & Proposal Evaluation

Summary: This process and tool assesses skill-levels and the ability of an offeror to attract and retain labor. This process and tool is also used to identify appropriate skill-mixes and the associated labor rates for each skill. It can be used for both IDIQ and non-IDIQ type contracts and A-76 studies. The source data comes from periodic Bureau of Labor Statistics (BLS) salary surveys, (or another similar benchmark) which include specific Labor Category Definitions and associated Direct Labor Rates. Model includes Direct Labor Rates per hour for Engineers, Computer Programmers, Computer System Analysts, Computer System Analysts Supervisor/Manager, and Engineering Technicians by geographical area. Direct labor rates for many other categories such as base support type activities are also available. This process and automated tool assesses the realism of proposed labor by identifying unrealistically low or high proposed rates. It also assesses the offeror's ability to attract and retain required labor -- "Can the contractor realistically expect to provide the bid labor for the price offered?" Used in reverse it is also very powerful -- If rate equates to skill-level 'X', is this skill level adequate to accomplish the job, based on inputs from appropriate functional specialists such as engineers, etc. The associated automated tool is easy to use, identifies what percentage of the benchmark's population was above and below any specific labor rate, and also automatically outputs some briefing charts.

Classification: Unclassified

Sponsor: ESC/FMC

Performer: ESC/FMC
Ellen Coakley with Support from Tecolote Research, Inc.

Resources: FY Dollars Staff-years

Schedule: Fielded

Data Base: (BLS rates are updated regularly)

Publications:

Category: II.B

Keywords: Government, Estimating, Analysis, Weapon Systems, Manpower/Personnel, Labor, Survey, Computer Model

ESC/FMC-2

Title: Use of Automated Cost Estimator-Integrated Tools (ACE-IT) for Cost Proposal Evaluation and the Storage of Cost/Schedule/Technical Data

Summary: Automated Cost Estimator-Integrated Tools (ACE-IT) can be used as an analysis tool to evaluate Cost Proposals. The Cost Proposal data would be loaded into ACE-IT's Automated Cost Data Base (ACDB) from computer disk or by electronic transfer and then analyzed in CO\$TAT (the statistics module) with the resulting trends and analyses stored in the ACE Knowledge Base. In addition to using ACE for proposal evaluation of the instant contract, ACE-IT would be used to store proposal data for all offerors and to develop trend factors and algorithms by contractor.

Classification: Unclassified

Sponsor: ESC/FMC

Performer: ESC/FMC, ESC/FMCT

Tecolote Research, Inc.

Resources: FY Dollars Staff-years

Schedule: Start End

May 96

Data Base: Title:

Description: Data from Cost Proposals

Automation: PC ACE-IT Windows ACE/COSTAT/ACDB

Publications:

Category: II.B

Keywords: Government, Estimating, Analysis, Weapon Systems, Data Collection, Data Base

ESC/FMC-3

Title: Industry/Government C² Cost Working Group

Summary: ESC/FMC is in the process of organizing a government/industry C² Working Group. All Government Agencies are invited to participate, particularly the C² Focal Points from each agency.

Classification: Unclassified

Sponsor: ESC/FMC

Performer: ESC/FMC

Resources: FY Dollars Staff-years

Schedule: Start End

May 97 Oct 98

Data Base:

Publications:

Category: I.B

Keywords: Industry, Government, Weapon Systems, Electronics/Avionics, Acquisition Strategy, Survey

ESC/FMC-4

Title: C² Cost Information Center Web Site

Summary: The C² Cost Information Center is a Web Site. It is available for both Government and Industry to use and be joint contributors. The initial scope includes: Estimating Methodology Knowledge Bases, search capability across the entire web site, Commercial Off-the-Shelf (COTS) directories (by vendors, product, & Government contract), COTS Hardware and Software Primers, links to other appropriate sites and periodic articles written by guest writers (senior Government & industry).

Classification: Unclassified

Sponsor: ESC/FMC

Performer: ESC/FMC

Ellen Coakley, ESC/FMCT, and Tecolote Research, Inc.

Resources: FY Dollars Staff-years

Schedule: Jul 97 Initial Fielding for beta testing
Feb 98 On ESC/FM Web Page

Data Base:

Publications:

Category: II.B

Keywords: Industry, Government, Weapon Systems, Electronics/Avionics, Acquisition Strategy, CER, Estimating, Method

ESC/FMC-5

Title: "Open" Estimating Tool for Software-Intensive Programs with COTS H/W & S/W

Summary: This tool can be used to estimate programs that are software-intensive with commercial off-the-shelf (COTS) hardware and COTS software. The initial focus of the tool is on estimating Management Information Systems (MIS)/Automated Information Systems (AIS) - Type Programs. These types of Programs with today's technology are being developed using Fourth Generation Languages (4GLs) and as much COTS software as possible - creating the need for COTS software integration. This tool's primary objective is to be able to estimate this type of environment. The scope of the tool is all acquisition costs for these types of programs, including software maintenance support.

Classification: Unclassified

Sponsor: ESC/FMC

Performer: ESC/FMC
Ellen Coakley, Peggy Wells, and Tecolote Research, Inc.

Resources: FY Dollars Staff-years

Schedule: Start End
Jan 97 Jun 97 (Initial Fielding)
May 98 (Production release)

Data Base: TBD

Publications: TBD

Category: II.C

Keywords: Government, Estimating, Analysis, Weapon Systems, Electronics/Avionics, EMD, Data Collection, Survey, Expert System

ESC/FMC-6

Title: "NOW" Data Collection Process & Analysis

Summary: This Data Collection Process will allow Cost/Schedule/Technical and Programmatic Metrics of a Program to be collected electronically "as-you-go" in a program (instead of the back-fill data collection process). It will obtain metrics through-out the life of the Program focusing on metrics that the Contractor already has available. These metrics will be obtained electronically from the contractor and automatically entered into ACE-IT.

Classification: Unclassified

Sponsor: ESC/FMC

Performer: ESC/FMC

Ellen Coakley, ESC/FMCT, and Tecolote Research, Inc.

Resources: FY Dollars Staff-years

Schedule: Start End

Summer 97

Limited effort to date due to lack of funding

Data Base: Title:

Description: Data from Cost Proposals and Cost/Schedule/Technical data for on-contract efforts

Automation: PC ACE-IT Windows-based Automated Cost Data Base

Publications:

Category: II.A.1

Keywords: Government, Estimating, Analysis, Weapon System, Electronics/Avionics, EMD, Labor, Overhead/Indirect, Engineering, CPR/CCDR, Data Collection, Data Base

MINISTRY OF DEFENCE

| | | |
|-----------------|---|----------|
| Name | Special Procurement Services/Cost Forecasting (SPS/CF) An Agency of the MoD UK | |
| Address | Elm 1a #187 MoD Abbey Wood Bristol BS34 8JH UK | |
| Director | Geoff Hollinrake | |
| Size | Professional: | 66 |
| | Support: | 2 |
| | Subcontractors: | 10 |
| Focus | Cost Forecasting advice and support to the MoD UK. | |
| Activity | Number of projects in process: | 135 |
| | Average duration of a project: | 4 months |
| | Average number of staff members assigned to a project: | 3 |
| | Average number of staff-years expended per project: | 0.4 |
| | Percentage of effort conducted by subcontractors: | 20% |

SPS/CF-1

Title: Software Support Cost Model Project (SSCMP)

Summary: The overall aim of the SSCMP is to develop a software package to enable procurers, managers, and designers to estimate the costs of support for software over its in-service life. The program started in 1991 with a theoretical feasibility study, followed by a Software Questionnaire Study and Pilot study completed in April 1995. The Pilot Study suggested that the key factors that influence software support costs are not necessarily size, complexity, or age, which are the factors usually identified in current thinking. A Main Study is now underway with the following objectives: to define the factors and effects that have an impact on software support costs and to develop a concept model of software support based on a study of MoD support activities.

Classification: Unclassified

Sponsor: Specialist Procurement Services - UK MOD
Mr. D Thombs, 011-44-117-913-2754

Performer: BMT Reliability Consultants Ltd, Fareham, UK

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96/97 | \$200,000 | 1.0 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Dec 95 | Jan 99 |

Data Base: Using Microsoft Excel to store and manipulate collected data.

Publications: Reports on specific activities throughout the program.

Category: II.C

Keywords: Government, Estimating, Weapon Systems, Concept Development, Software, Data Collection, Mathematical Modeling, Computer Model

SPS/CF-2

Title: Operating and Support Costs Analysis Models (OSCAM)

Summary: An aid to reducing the overall through life cost of owning warships by helping in the selection of the equipment fit, and identifying the benefit accrued from early investment in ILS, by modeling the dynamic relationship between the acquisition and the operating and support costs.

Classification: Unclassified

Sponsor: Specialist Procurement Services - UK MOD
Mr. B K Tanner (44-117-913-2762)

Performer: HVR Consultants, Alton, Hampshire

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$250,000 | 1.0 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct 96 | Dec 98 |

Data Base: Title: Powersim

Description:

Automation:

Publications:

Category: II.C

Keywords: Government, Estimating, Ships, Demonstration/Validation, Mathematical Modeling,
Computer Model

AIR FORCE INSTITUTE OF TECHNOLOGY

| | | |
|-----------------|---|-----------|
| Name | Graduate School of Logistics and Acquisition Management Air Force Institute of Technology (AFIT/LAS) | |
| Address | 2950 P Street, Building 641 Wright Patterson AFB, OH 45433-7765 | |
| Director | Dr. Roland D. Kankey, (937) 255-7777, ext. 3382 | |
| Size | Professional: | 30 |
| | Support: | 6 |
| | Consultants: | 0 |
| | Subcontractors: | 0 |
| Focus | The School's research focus is on logistics and acquisition issues, to include cost analysis, cost management, contracting, and acquisition management. Items reported here are a combination of a faculty research and student thesis projects that are directed by AFIT faculty and worked on as an integral part of the academic program leading to Master of Science degrees. | |
| Activity | Number of projects in process: | 5-10 |
| | Average duration of a project: | 15 months |
| | Average number of staff members assigned to a project: | — |
| | Average number of staff-years expended per project: | — |
| | Percentage of effort conducted by consultants: | 0% |
| | Percentage of effort conducted by subcontractors: | 0% |

AFIT/LAS-1

Title: Calibration and Validation of the Cocomo II.1997.0 Cost/Schedule Estimating Model to the Space and Missile Systems Center Database

Summary: The goal of this study was to determine the accuracy of COCOMO II.1997.0, a software cost and schedule estimating model, using Magnitude of Relative Error, Mean Magnitude of Relative Error, Relative Root Mean Square, and a 25 percent Prediction Level. Effort estimates were completed using the model in default and in calibrated mode. Calibration was accomplished by dividing four stratified data sets into two random validation and calibration data sets using five times resampling. The accuracy results for the calibrated mode were poor, the best having a Mean Magnitude Relative Error of 33.32% (with only 40% of the estimates having a Magnitude of Relative Error less than 25%). It was found that homogeneous data is the key to producing the best results, and the model typically underestimates. The second part of this thesis was to try and improve upon the default mode estimates. This was accomplished by regressing the model estimates to the actual effort. Each original regression equation was transformed and tested for normality, equal variance, and significance. Overall, the results were promising; regression improved the accuracy in three of the four cases, the best having a Mean Magnitude Relative Error of 20.59% (with 75% of the estimates having a Magnitude of Relative Error less than 25%).

Classification: Unclassified

Sponsor: SMC/FMC, Shirley Tinkler
MCR, Inc. Sherry Stukes

Performer: Wayne A. Bernheisel, advised by Dan Ferens and Dr. David Christensen
(937) 255-7777, ext. 3382

Resources: FY Dollars Staff-years

Schedule: Start End
Sep 96 Aug 97

Data Base: Version 2.1 of the SMC Software Database (SWDB) of more than 2,400 programs.

Publications: Thesis available from Defense Technical Information Center: AD-A329977

Categories: II.A.1, II.A.2, II.D

Keywords: Government, Analysis, Estimating, EMD, Life Cycle, Labor, Data Collection, Statistics/Regression, Study

AFIT/LAS-2

Title: A Cost-Benefit Analysis of Earned Value Management System Criteria

Summary: In December 1996, the Cost/Schedule Control Systems Criteria (C/SCSC) was officially replaced by the Earned Value Management Systems (EVMS) criteria. The switch to EVMS, coupled with current acquisition reform changes, has left many wondering what the effects of these changes will be. This thesis defines the costs and benefits of the old C/SCSC, and then compares them. Additionally, this thesis discusses the changes accompanying the switch to EVMS and the effect on the costs and benefits. The marginal costs of C/SCSC are defined as the difference between the costs of a C/SCSC-compliant system and a contractors 'normal' management control system. The marginal system compliance costs are 334 - 481 person days, while the marginal operating costs are 50% of the C/SCSC-compliant operating costs. Fourteen benefits of C/SCSC are detailed in this thesis. The most important benefit discovered was the data reliability that comes with a criteria-compliant management control system. The main difference between C/SCSC

and EVMS is the system certification process. Under C/SCSC, DoD teams would have to certify a contractor's system. Under EVMS, contractors have the ability to self-certify their system (with final government approval). Cost savings may result through self-certification without reductions in the benefits.

Classification: Unclassified
Sponsor: OUSD(A&T)API/PM
Performer: Air Force Institute of Technology
John Cole and Judson Fussell, advised by Dr. David Christensen, and Dr. Norm Ware
(937) 255-7777, ext. 3378
Resources: FY Dollars Staff-years
Schedule: Start End
Jun 96 Aug 97
Data Base: **Title:** None
Description: Articles published in various defense journals and special reports
Automation: No
Publications: Thesis available from Defense Technical Information Center: ADA329813
Category: I.B
Keywords: Government, Policy, Weapon Systems, Life Cycle, Integration, Data Collection, Study

AFIT/LAS-3

Title: An Examination of the Demographics and Career Progression of Air Force Institute of Technology Cost Analysis Graduates
Summary: The Air Force Institute of Technology (AFIT) was asked to develop a graduate curriculum to support cost analysts in the acquisition arena in October 1980. The first class entered in May 1982 and graduated in September 1983 with Master of Science degrees in Systems Management. This degree program gained autonomy by offering its first true Master of Science degree in Cost Analysis in 1988. Now there are nearly thirteen years of graduate cost analysts (GCAs) in the workforce. This thesis examined the impact this program has had on these graduates and the Air Force. Surveys were mailed out to 73 of the 75 currently active-duty graduates in the classes from 1983 through 1994. Forty responses were received and evaluated. The general consensus is that the GCA program is very useful to the graduates and beneficial to their careers. The main strengths of the program include the ACEIT software training and the combination of Department of Defense (DOD) application, regression, and statistics. The weaknesses of the program include a lack of training to actually complete a cost estimate and a need for more in-depth education regarding budget topics. Overall, graduates believe this program could not be replaced by a civilian institution.
Classification: Unclassified
Sponsor: None
Performer: Christopher S. Dalton, advised by Lt Col Stephen Giuliano and Dr. Roland Kankey
AFIT/LAS, (937) 255-7777, ext. 3382
Resources: FY Dollars Staff-years
Schedule: Start End
Jun 96 Aug 97

Data Base:

Publications: Thesis available from Defense Technical Information Center: AD-A329975

Category: II.A.1

Keywords: Government, Survey, Study

AFIT/LAS-4

Title: The Determinants of the Housing Choices of Military Families: Implications for Military Policy

Summary: This thesis investigates both the determinants of housing choice of military families, as well as the possible affects on housing choice that changes in policy could have. Data from the 1992 Surveys of Officer and Enlisted Personnel and Their Spouses are weighted to reflect current force structure levels and are used with the multinomial logit technique of maximum likelihood estimation to develop a model that both gives insight into what factors influence military families' housing decisions as well as how policy changes would affect those housing choices. In particular, changes in policies pertaining to tour length, military pay, and closing costs are investigated. This thesis indicates that an increase in the average tour length for military personnel by one year could save 118 million dollars per year in housing costs. Furthermore, an increase in military compensation would save significant amounts of housing funds. Finally, if the military were to pay the transaction costs associated with home sales the homeownership rate would nearly double and the military would recoup two thirds of the funds spent in such a program through decreased military family housing expenses.

Classification: Unclassified

Sponsor: None

Performer: William R. Forster, advised by Dr. H. Leroy Gill and Lt Col Stephen A. Giuliano
AFIT/LAS, (937) 255-7777, ext. 3382

Resources: FY Dollars Staff-years

Schedule: Start End
Jun 96 Aug 97

Data Base:

Publications: Thesis available from Defense Technical Information Center: AD-A329926

Category: II

Keywords: Government, Policy, Manpower/Personnel, Operations and Support, Mathematical Modeling, Study

AFIT/LAS-5

Title: Factors Affecting the Unit Cost of Weapon Systems

Summary: This research identifies variables and specifies equations that can be used to estimate the unit production cost of a weapon system. It is concerned with both explanation and prediction. Three major variables identified are cumulative quantity, production rate, and change in regime. Cumulative quantity is used in learning curve theory. Production rate is found in the U-shaped short- and long-run cost curves of economic theory. This study uses the term regime to refer to any major change in the production environment of a weapon system. This research attempts to integrate the use of these three variables. A

change in regime may be due to a change in acquisition strategy, configuration, or manufacturing method. It is recommended that a categorical variable be used to capture the effect of a change in regime. Several specific equations are proposed and discussed. In general, they entail a shift, shift and rotation, or shift and two rotations of the cost-quantity-rate surface due to a change in regime. Many accepted methods of integrating learning and rate do not produce U-shaped rate curves; this study suggests one that does. Principles and equations discussed are applied in modeling the cost history of three missile systems.

Classification: Unclassified
Sponsor: USA SSDC/MDSTC
Performer: Mark Glenn, advised by Dr. Roland Kankey and Lt Col Stephen Giuliano
 AFIT/LAS, (937) 255-7777, ext. 3382
Resources: FY Dollars Staff-years
Schedule: Start End
 Jun 96 Aug 97
Data Base:
Publications: Thesis available from Defense Technical Information Center: AD-A329821
Category: II.A.2
Keywords: Government, Estimating, Missiles, Production, Mathematical Modeling, Study

AFIT/LAS-6

Title: Calibration and Validation of the Sage Software Cost/Schedule Estimating System to United States Air Force Databases
Summary: This research entailed calibration and validation of the SAGE Software Cost/Schedule Estimating System, Version 1.7 as a means to improve estimating accuracy for DoD software-intensive systems, and thereby introduce stability into software system development. SAGE calibration consisted of using historical data from completed projects at the Space and Missile Systems Center (SMC) and the Electronic Systems Center (ESC) to derive average performance factors (i.e., calibration factors) for pre-defined categories of projects. A project was categorized for calibration by either its primary application or by the contractor that developed it. The intent was to determine the more appropriate categorization for calibration. SAGE validation consisted of using the derived calibration factors to predict completed efforts, not used in deriving the factors. Statistical resampling employing Monte Carlo simulation was used to calibrate and validate the model on each possible combination of a category's projects. Three statistical measures were employed to measure model performance in default and calibrated estimating modes. SAGE generally did not meet pre-established criteria for estimating accuracy, although the model demonstrated some improvement with calibration. Calibration of projects categorized by contractor resulted in better calibrated model performance than calibration of projects categorized by application. This categorization is suggested for future consideration.
Classification: Unclassified
Sponsor: SMC/FMC, Shirley Tinkler
 MCR, Inc. Sherry Stukes
Performer: David Marzo, advised by Daniel Ferens and Dr. David Christensen
 AFIT/LAS, (937) 255-6280

Resources: FY Dollars Staff-years
Schedule: Start End
 Sep 96 Aug 97
Data Base: Version 2.1 of the SMC Software Database (SWDB) of more than 2,400 programs.
Publications: Thesis available from Defense Technical Information Center: AD-A329958
Categories: II.A.1, II.A.2, II.D
Keywords: Government, Analysis, Estimating, EMD, Life Cycle, Labor, Data Collection, Statistics/Regression, Study

AFIT/LAS-7

Title: Calibration and Validation of the Checkpoint Model to the Air Force Electronic Systems Center Software Database

Summary: This research effort focused on the calibration and validation of CHECKPOINT Version 2.3.1, a computerized software cost estimating tool, to the USAF Electronic Systems Center (ESC) software database. This thesis is a direct follow-on to a 1996 CHECKPOINT study at the Air Force Institute of Technology, which successfully calibrated and validated CHECKPOINT to the SMC software database. While this research generally parallels the methodology in the aforementioned study, it offers advancements in the CHECKPOINT calibration and validation procedure, and it refines the data stratification process and the statistical analyses employed. After stratifying the ESC software database into ten usable data sets, the author calibrated and validated the CHECKPOINT model on each data set. Although the results of this study exhibited occasional improvements in estimating accuracy for both the calibration and validation subsets, the model generally failed to satisfy the accuracy criteria used to assess overall calibration success and estimating accuracy ($MMRE \leq 0.25$, and $PRED(0.25) \geq 0.75$). Thus, the CHECKPOINT model was not successfully calibrated or validated to the 1997 version of the ESC database. The results of this study illuminate the need for complete, accurate and homogeneous data as a requirement for a successful calibration and validation effort.

Classification: Unclassified

Sponsor: ESC/FMCT
 Hanscom AFB, MA 01731-2117

Performer: Thomas Shrum, advised by Daniel Ferens and Dr. David Christensen
 AFIT/LAS, (937) 255-6280

Resources: FY Dollars Staff-years

Schedule: Start End
 Sep 96 Aug 97

Data Base: Electronic System Center Software Database

Publications: Thesis available from Defense Technical Information Center: AD-A329908

Categories: II.A.1, II.A.2, II.D

Keywords: Government, Analysis, Estimating, EMD, Life Cycle, Labor, Data Collection, Statistics/Regression, Study

AFIT/LAS-8

Title: A Study of Historical Inflation Forecasts Used in the Department of Defense Future Years Defense Program

Summary: This thesis explores historical inflation forecasts used in the Department of Defense (DoD) Future Years Defense Program. The study examines historical DoD forecasts against experienced inflation as measured by the Gross National Product and Gross Domestic Product implicit price deflator (GNP/GDP IPD) from 1979 to 1996. This study also compares the accuracy of DoD forecasts with those made by the Congressional Budget Office (CBO) and Data Resources, Incorporated (DRI). The results regarding the performance of historical DoD inflation forecasts are mixed. Upon examining budget through five-year GNP/GDP IPD forecast spans, DoD short-term results do not indicate a downward bias and DoD long-term results do indicate a downward bias. Overall DoD forecast bias was lower than the CBO and DRI, which tended to overestimate inflation. Next, forecast accuracy was evaluated in which all agencies equally anticipated budget year inflation. Forecasts for later years also yielded mixed results. CBO and DRI forecasts tend to exhibit less dispersion, but DoD tends to have less bias. DRI one, two, and three year forecasts and CBO four and five year projections demonstrated the least dispersion while DoD forecast results were more dispersed. Possible explanations and implications of these findings are provided.

Classification: Unclassified

Sponsor: SAF/FMCE
1130 Air Force
The Pentagon
Washington, DC 20330-1120

Performer: Mark Sweitzer, advised by Dr. Roland Kankey, Dr. David Christensen, and Dr. Anthony D'Angelo
AFIT/LAS, (937) 255-6280

Resources: FY Dollars Staff-years

Schedule: Start End
Sep 96 Aug 97

Data Base:

Publications: Thesis available from Defense Technical Information Center: AD-A329995

Category: II.A.1

Keywords: Government, Analysis, Data Collection, Study

AFIT/LAS-9

Title: Tracking Overhead Orta Costs in Technology Transfer Activities

Summary: An ever shrinking Research and Development (R&D) budget, coupled with a widespread perception in industry and government that the nation is not realizing an adequate return from its substantial investment in the federal laboratory system, has paved the way for an increase in the transfer of technology from the federal laboratories to the private sector. However, the increase in technology transfer comes at a price as each federal laboratory with 200 or more scientific, engineering, or related positions is required to have at least one full time Office of Research and Technology Applications (ORTA) position. The objective of this research is to determine the indirect cost of performing technology transfer by identifying the resources consumed by several key ORTA organizations and the activities performed within these organizations. A previous research effort into the direct labor side of technology transfer activities identified several steps of the Transfer

Master Process that had little or no resources expended. It was hypothesized that the ORTA organizations, which are considered indirect labor by most costing methods, would expend considerable portions of their resources on these activities. This hypothesis was supported, as all but two of the identified steps consumed a significant portion of the ORTA resources. The two steps that were insignificant deal with the collection of revenues, which either take little time to complete or were performed by the financial management branch of the laboratory instead of at the ORTA. It was also hypothesized that comparisons could be made among the various ORTAs to determine a "step-wise" level of resources expended based on the amount of technology being transferred. This hypothesis was not supported, however, as there was too much variance in resources consumed to technology transfer activity level among the ORTAs researched.

Classification: Unclassified
Sponsor: AFRL/TTO
 Wright Patterson AFB, OH 45433
Performer: Thomas Van Egeren, advised by MAJ Richard Franza and Dr. David Christensen
 AFIT/LAS, (937) 255-6280
Resources: FY Dollars Staff-years
Schedule: Start End
 Sep 96 Aug 97
Data Base:
Publications: Thesis available from Defense Technical Information Center: AD-A329941
Category: I.B
Keywords: Government, Budgeting, Overhead/Indirect, Data Collection, Study

AFIT/LAS-10

Title: The Impact of the Packard Commission's Recommendations on Reducing Cost Overruns in Major Defense Acquisition Programs
Summary: This thesis examines the impact that recommendations made by the President's Blue Ribbon Commission on Defense Management, informally known as the Packard Commission, had on reducing cost overruns in major DoD acquisition programs. Cost overruns are a recurring problem in the DoD, and the study of possible effects resulting from the implementation of acquisition reform efforts such as the Packard Commission study could alter this trend. In this era of acquisition reform and downsizing it's important that policy makers understand the effects past and current policies have had and are having on reducing the ever present problem of cost overruns. Conclusions drawn in this thesis may guide and direct DoD policy makers in drafting future regulations and policies. This study examined 269 contracts completed between January 1, 1988 and December 31, 1995. It was found that cost performance for contracts completed after the recommendations went into effect was poorer than cost performance prior to the change. It was also found that a more significant difference occurred between contracts in development phases than those in production phases. In fact, percentage cost overruns for development contracts nearly tripled after the policy went into effect. Possible explanations and implications of this discovery are provided.
Classification: Unclassified
Sponsor: None
Performer: David Searle, advised by MAJ Caisson Vickery and Dr. David Christensen
 AFIT/LAS, (937) 255-6280

Resources: FY Dollars Staff-years
Schedule: Start End
 Sep 96 Aug 97

Data Base:

Publications: Thesis available from Defense Technical Information Center: AD-A329942

Category: I.A

Keywords: Government, Analysis, Weapon Systems, EMD, Production, CPR/CCDR, Data Collection, Study

AFIT/LAS-11

Title: Estimating KC-137 Aircraft Ownership Costs in the Brazilian Air Force (BAF)

Summary: This research addresses the estimation of operation and support (O&S) costs of the Brazilian Air Force KC-137 aircraft. BAF lacks an established set of procedures for computing life cycle costs, which prejudices the management of the KC-137 program. The purpose of the study is to develop an O&S cost breakdown structure and a set of cost estimating equations in order to calculate the ownership costs of the KC-137 aircraft. The research is divided into five parts: 1) review of the most commonly used LCC accounting methods; 2) analysis of the KC-137 O&S systems and database characteristics; 3) development of an O&S cost breakdown structure based on the CORE model; 4) selection of cost estimating procedures; and 5) development of cost equations and calculation of costs. The annual KC-137 O&S costs resulted in US \$9,529 per flight-hour at a yearly usage rate of 1700 hours. The study yielded evidence that the current O&S systems incur a high percentage of fixed costs (57.5%) and allocated costs (43.2%). Therefore, the BAF may benefit from the use of LCC and more accurate cost accounting methods, such as activity-based costing. Other implications for the Brazilian Air Force and recommendations for further research are also discussed.

Classification: Unclassified

Sponsor: None

Performer: Ulisses Bonasser (BAF), advised by Dr. Roland Kankey (LAS) and MAJ William Scott LAL, (937) 255-6280

Resources: FY Dollars Staff-years
Schedule: Start End
 Sep 96 Aug 97

Data Base:

Publications: Thesis available from Defense Technical Information Center: AD-A331196

Category: II

Keywords: Government, Analysis, Aircraft, Operations and Support, Data Collection, Study

AFIT/LAS-12

Title: Economic Analysis for an F-22 Organic vs. Contractor Aircraft Battle Damage Repair Ownership Decision

Summary: The purpose of this study was to evaluate whether Contractor Logistics Support (CLS) is a viable alternative to Combat Logistics Support Squadrons (CLSSs) for providing F-22 Aircraft Battle Damage Repair (ABDR). Legalities, practicalities, and cost-effectiveness were key ownership concerns. United States Code, Office of Management and Budget, Department of Defense (DoD), and United States Air Force (USAF) requirements were reviewed to address legal and policy issues and whether F-22 ABDR is military essential. The Army's Logistics Civil Augmentation Program (LOGCAP) award fee history was used to assess the potential performance of F-22 ABDR CLS personnel. F-117 ABDR team requirements and costs were used to estimate F-22 CLSS costs. Results show DoD must decide if F-22 ABDR is a core logistics function and the USAF must determine F-22 ABDR requirements before outsourcing legality is clear. However, DoD civilian reliance continues today, and LOGCAP experiences attest that contractors consistently meet or exceed all clearly stated requirements. Analysis found that CLSS will provide higher combat readiness; although, CLS may provide slightly less combat readiness, but for potentially less cost. A dual approach, using a mixture of CLSS and CLS, could provide the most effective capability in terms of both combat readiness and cost.

Classification: Unclassified

Sponsor: SM-ALC/LATB

Performer: John Kitchens, advised by MAJ Chris Burke (LAL) and LTC Stephen Giuliano
LAS, (937) 255-6280

Resources: FY Dollars Staff-years

Schedule: Start End
Sep 96 Aug 97

Data Base:

Publications: Thesis available from Defense Technical Information Center: AD-A329925

Category: I.A

Keywords: Government, Analysis, Aircraft, Operations and Support, Economic Analysis, Study

AFIT/LAS-13

Title: A Preliminary Study of Using the SEI's Capability Maturity Model to Set Statistical Control Bounds on DoD Contractor Cost and Schedule Performance

Summary: Current methods for monitoring the performance of Department of Defense (DOD) software development contractors have not been successful in reversing the current trend of over budget and behind schedule software development. The DOD has adopted the Software Engineering Institute's (SEI's) Capability Maturity Model (CMM) as a method of determining the process maturity of a software developer with the idea that a more mature process will lead to improved cost and schedule performance. The goal of this research was to determine if a model based on the CMM rating level of a contractor could be developed and used in conjunction with statistical process control to determine if contractor performance was progressing in a satisfactory manner. To investigate this possibility descriptive statistics were applied to historical contractor performance data and a model was established. A different set of historical data was then used to evaluate the performance of the new model. This performance was then compared to the performance of current methods of statistical control. The results obtained in this research

suggest that using the CMM rating level of a contractor to set statistical control bounds is as good, and perhaps better than, the current method being employed.

Classification: Unclassified
Sponsor: AFCA/XPS
Scott AFB, IL 62225
Performer: Jeffrey Schaefer, advised by Daniel Ferens and MAJ Terry Alder
AFIT/LAS, (937) 255-6280
Resources: FY Dollars Staff-years
Schedule: Start End
Sep 96 Aug 97
Data Base:
Publications: Thesis available from Defense Technical Information Center: AD-A329855
Category: II.D
Keywords: Government, Analysis, Software, CPR/CCDR, Data Collection, Study

AFIT/LAS-14

Title: Cost Per Flying Hour Analysis of the C-141
Summary: This paper sought to examine if DoD's current transfer pricing method places AMC in a price competitive position with the government commercial rates and promotes managers to make the best decisions. Attention was paid to the stated customer concerns that current transfer pricing methods incorporate overhead and sunk costs that are not attributable to routine movement of peacetime cargo and could make AMC non-price competitive with commercial vendors. The findings are that AMC currently uses full cost transfer pricing, as required by DoD policy, that include significant overhead and sunk costs associated with its wartime responsibilities. The full cost method of transfer pricing is not in congruence with the generally accepted accounting practices and the private sector position that, with excess capacity and no outside market, a unit should transfer price at variable cost. The current cost per flying hour is inflated by fixed costs, primarily overhead and sunk cost, by 60.47 percent. This means the CPFH is 2.5 times greater than the cost that AMC incurs for operating a peacetime mission.

Classification: Unclassified
Sponsor: None
Performer: Christopher Omlor, advised by Dr. William Cunningham and MAJ William Scott
AFIT/LAL, (937) 255-2820
Resources: FY Dollars Staff-years
Schedule: Start End
Sep 96 Aug 97
Data Base:
Publications: Thesis available from Defense Technical Information Center: AD-A329936
Category: II.A.1
Keywords: Government, Analysis, Aircraft, Operations and Support, Fixed Costs, Variable Costs, Data Collection, Study

AFIT/LAS-15

Title: Activity-Based Costing in Logistics
Summary: Study of the nature, extent, and impact of activity-based costing in logistics operations of firms.
Classification: Unclassified
Sponsor:
Performer: MAJ Mark Caudle
AFIT/LAS, (937) 255-7777, ext. 3370
Resources: FY Dollars Staff-years
Schedule: Start End
Fall 95 Fall 98(Projected)
Data Base:
Publications: Dissertation available from Defense Technical Information Center by Spring 1999.
Category: II.A.1
Keywords: Industry, Analysis, Operations and Support, Survey, Study

AFIT/LAS-16

Title: A Return on Investment Model for Technology Transfer
Summary: The purpose of this research is to develop a return on investment (ROI) model for potential use by those holding the Research & Development "purse strings" at the laboratory level. This model will estimate return on investment of individual cooperative research and development agreements (CRDAs) to determine which to pursue in order to maximize RDT&E return on investment. Presently, the Air Force does not have an ROI model in place for CRDA evaluation. The basis for this model is the Multiattribute Decision Analysis methodology of Canada & Sullivan.
Classification: Unclassified
Sponsor: AFRL/XP, Steve Guilfoos
Performer: Brad McDonald, advised by MAJ Rick Franza and MAJ Daryl Hauck
AFIT/LAS, (937) 255-6280
Resources: FY Dollars Staff-years
Schedule: Start End
Sep 97 Aug 98
Data Base:
Publications: Thesis will be available from DTIC in Winter 1998.
Categories: II.B, II.C
Keywords: Government, Estimating, Airframe, Propulsion, Electronics/Avionics, Concept Development, Fixed Costs, Variable Costs, Data Collection, Survey, Mathematical Model

AFIT/LAS-17

Title: Multinational Communications Satellite Cost Study

Summary: It is generally believed that a multinational satellite development effort will save money over a single-nation development. This view may be short-sighted, ignoring additional costs associated with integrating the project management efforts of multiple, international contractors. While the technical details of such an effort were addressed in the Future MILSATCOM Architecture Study (FMAS), this study seeks to determine the costs associated with integrating the project management efforts of multiple, international contractors in a multinational project development effort. This study will compare the project management approaches and actual data from the FMAS study with other completed, published efforts, and published approaches to multinational cooperation.

Classification: Unclassified

Sponsor: Air Force Cost Analysis Agency

Performer: David Bach, advised by Dr. Roland Kankey, LAS, and MAJ Bryan Turner
LSS, (937) 255-6280

Resources: FY Dollars Staff-years

Schedule: Start End
Sep 97 Aug 98

Data Base:

Publications: Thesis will be available from DTIC in Winter 1998.

Category: II.D

Keywords: Government, Analysis, Space Systems, Data Collection, Study

AFIT/LAS-18

Title: Fighter CERS and Seemingly Unrelated Regressions

Summary: This study compares the ability of individual CERS for engineering, tooling, manufacturing, and quality control developed using ordinary least squares regression with those developed using Seemingly Unrelated Regression (SUR). The study tests the hypothesis that SUR will take advantage of relationships existing between the error terms of the different equations and result in more accurate cost estimates.

Classification: Unclassified

Sponsor: Mr. John Dorsett, Air Force Cost Analysis Agency

Performer: Robert Bickel and Lance Whitfill, advised by Dr. Roland Kankey and MAJ Daryl Hauck
LAS, (937) 255-6280

Resources: FY Dollars Staff-years

Schedule: Start End
Sep 97 Aug 98

Data Base:

Publications: Thesis will be available from DTIC in Winter 1998.

Category: II.B

Keywords: Government, Estimating, Aircraft, Statistics/Regression, CER

AFIT/LAS-19

Title: Software Support Cost Estimating Models: a Comparative Study of What the Models Estimate

Summary: A follow on effort to the Coggins-Russell AFIT Thesis 1993. This study compares five software-estimating models: SoftEst, SEER-SEM, Price-S, SoftCost-OO, and SPR-Knowledge Plan 2.0. This study will concentrate on the estimation of support costs for each of the given models and address the following questions: What time span is the maintenance/support option covering for the various models? Does it match the inventory time period for the Air Force? What phases of support are covered by the various models? What are the unique input parameters that directly affect the support costs? What estimating methodology is being used? What is the underlying basis for the parameter values? Does a change in development method or language affect support costs? How does a compression of schedule affect support costs? Does a change in size affect the support costs? What is the recommended estimating range? What type of data/database was the current model calibrated to?

Classification: Unclassified

Sponsor: Captain Dave Marzo, Air Force Cost Analysis Agency

Performer: Kevin Brummert and Phil Mischler, advised by Dan Ferens and MAJ Daryl Hauck
LAS, (937) 255-6280

Resources: FY Dollars Staff-years

Schedule: Start End
Sep 97 Aug 98

Data Base:

Publications: Thesis will be available from DTIC in Winter 1998.

Categories: IIA.2, II.D

Keywords: Government, Analysis, Estimating, Operations and Support, Weapon Systems, Software, Case Study, Study

AFIT/LAS-20

Title: A Quantitative Cost Analysis of the First High Altitude Endurance Unmanned Aerial Vehicle - the Global Hawk

Summary: This thesis discusses the history of unmanned aerial vehicles (UAV), the current and near term capabilities of the modern UAV, and compares the Global Hawk UAV production cost and operating and support cost to a comparable manned system - the U-2.

Classification: Limited Distribution / Classified Appendix

Sponsor: ASC/RAV

Performer: Brian Kehl and Mike Wilson, advised by LtCol Terry Adler and MAJ Daryl Hauck
LAS, (937) 255-6280

Resources: FY Dollars Staff-years

Schedule: Start End
Sep 97 Aug 98

Data Base:

Publications: Thesis will be available from DTIC in Winter 1998.

Category: II.A.1
Keywords: Government, Estimating, Analysis, Case Study, Study

AFIT/LAS-21

Title: Predictive Reliability of the Contractor Performance Assessment Report (CPAR) Process
Summary: This study evaluates the predictive reliability of the CPAR process by comparing CPAR ratings with actual cost & schedule variances. The study will also look into other relationships such as past performance rating vs. profitability.
Classification: Limited distribution
Sponsor: Mr. Thomas Fowler, ASC/SYG
Performer: John Odum, advised by LtCol Stephen Giuliano and MAJ Daryl Hauck
LAS, (937) 255-6280
Resources: FY Dollars Staff-years
Schedule: Start End
Sep 97 Aug 98
Data Base:
Publications: Thesis will be available from DTIC in Winter 1998. Distribution must be approved by ASC/SYG.
Category: II.A.1
Keywords: Government, Analysis, CPR/CCDR, Study

AFIT/LAS-22

Title: Cost/Benefit Analysis of Air Refueling Options for the North Pacific Theatre
Summary: This study will assess the number of flying hours used to position tankers/crews in Alaska to support routine peacetime air refueling requirements in the North Pacific. It will then compare various options for increasing tanker support in Alaska. Options to be considered include: increasing the Primary Aircraft Assigned (PAA) of the only tanker unit in Alaska; the reverse associate unit concept; and a temporary duty tanker task force. This study will also address less quantifiable measures such as the impact of increased tanker availability to the Pacific Air Expeditionary Force (AEF) and other world-wide contingencies.
Classification: Unclassified with references to classified OPLANS, CONPLANS, and Pony Express Taskings
Sponsor:
Performer: Mike Rauenhorst, Air Mobility Warfare Center, Ft Dix, NJ, advised by Dr. Roland Kankey, AFIT/LAS
Resources: FY Dollars Staff-years
Schedule: Start End
Jan 98 Jun 98
Data Base:
Publications:
Category: II
Keywords: Government, Analysis, Aircraft, Operations and Support, Case Study, Study

DEFENSE SYSTEMS MANAGEMENT COLLEGE

| | | | |
|-----------------|---|----------|--|
| Name | Defense Systems Management College | | |
| Address | 9820 Belvoir Road Building 206, Room 215 Fort Belvoir, VA 22060 | | |
| Director | Sharon Richardson, (703) 805-4455 | | |
| Size | Professional: | 11 | |
| | Support: | 2 | |
| | Consultants: | 0 | |
| | Subcontractors: | 0 | |
| Focus | Cost Analysis, Budget Process, Funds Management | | |
| Activity | Number of projects in progress: | 12 | |
| | Average duration of project: | 3 months | |
| | Average number of staff members assigned to a project: | 1-2 | |
| | Average number of staff-years expended per project: | 0.1 | |
| | Percentage of effort conducted by consultants: | 0% | |
| | Percentage of effort conducted by subcontractors: | 0% | |

DSMC-1

Title: Research on Ongoing Acquisition Research (ROAR)

Summary: ROAR is an on-line and World-Wide Web system available to DoD and university researchers who currently conduct studies on acquisition-related topics such as cost modeling and pricing concerns, engineering and manufacturing practices, industrial base issues, logistics, contracting, commercial practices, acquisition workforce management, and education, etc. Access is available via the ROAR BBS (703-805-2865) and voice (703-271-5988) for those who contribute from their own ongoing study.

Classification: Unclassified

Sponsor: Defense Systems Management College and Defense Acquisition University
Fort Belvoir, VA 22060

Mr. James Abellera, (703) 805-2525

Performer: DSMC Faculty

Resources: FY Dollars Staff-years

Schedule: Start End
89 Continuing

Data Base: *Title:*

Description: ROAR tracks over 2,500 studies around the world.

Automation: ROAR data became accessible via the Internet in the second half of CY 1995. The URL for ROAR is: <http://www.dsmc.dsm.mil/roar.html>.

Publications: New search results are available electronically every week via the ROAR BBS for registered subscribers until their projects are completed.

Category: I.B

Keywords: Industry, Government, Data Collection, Data Base

AEROSPACE CORPORATION

| | | |
|-----------------|---|---|
| Name | The Aerospace Corporation Cost and Requirements Department | |
| Address | 2350 E. El Segundo Boulevard El Segundo, CA 90245 Mail Station: M4/021 P.O. Box 92957 Los Angeles, CA 90009-2957 | |
| Director | Dr. Steven Glaseman, (310) 336-8576 | |
| Size | Professional: | 15 |
| | Support: | 1 |
| | Consultants: | About 1,000 Aerospace Corporation Engineers |
| | Subcontractors: | 0 |
| Focus | Acquisition reform, requirements engineering, relationship between requirements and cost, commercial practices, cost as an independent variable, space-system cost modeling, cost-risk analysis, schedule-risk analysis, statistical analysis, life-cycle cost analysis, cost/performance/design trade studies. | |
| Activity | Number of projects in process: | 6 |
| | Average duration of a project: | 1 year |
| | Average number of staff members assigned to a project: | 2 |
| | Average number of staff-years expended per project: | 1.0 |
| | Percentage of effort conducted by consultants: | |
| | | (Aerospace Corp. Engineers) 20% |
| | Percentage of effort conducted by subcontractors: | 0% |

AERO-1

Title: Costs of Space, Launch, and Ground Systems

Summary: Historical costs of space, launch, and ground systems, including non-recurring and recurring costs of military and civil space and launch vehicles, payloads, launch processing, launch delays, launch failures, software, ground facilities, learning rates, cost overruns, etc.

Classification: Unclassified; Government/FFRDC-only; Contractor-Proprietary Data.

Sponsor: The Aerospace Corporation's Internal Research and Development (IR&D) Program.

Performer: The Aerospace Corporation
MS: M4/021
P.O. Box 92957
Los Angeles, CA 90009-2957
S. A. Book, (310) 336-8655
E-mail: stephen.a.book@aero.org

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$100,000 | 0.6 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|----------------------------|
| FY87 | None (Maintenance ongoing) |

Data Base: Contractor-Proprietary

Publications: "Costs of Space, Launch, and Ground Systems," The Aerospace Corporation, Corporate Briefing ("The Whitehair Study"), April 1997.

Category: II.A

Keywords: Government, Policy, Space Systems, Life Cycle, Acquisition Strategy, Data Collection, Case Study, Data Base, Study

AERO-2

Title: Validation Testing of Commercial Risk-Analysis Software

Summary: Government-requested validation testing of commercial risk-analysis software products is an ongoing research effort. Some test cases investigate handling of simple, routine tasks, others "push the envelope" of their limitations and advertising. Most recently tested software was Risk Driver (Decision Products, Inc.). Currently under consideration for test is RISK Version 2.2 developed by Tecolote Research, Inc., for inclusion in ACE-IT. Deficiencies specifically noted in controlled-access, government/FFRDC-only, validation testing reports delivered to SMC/FMC locally for forwarding to AFCAA and SAF/FM. AF personnel at their option may pass on explanations of deficiencies to developers.

Classification: Unclassified, Controlled-Access, Government/FFRDC Only

Sponsor: AF Space and Missile Systems Center/FMC acting also on behalf of Air Force Cost Analysis Agency (AFCAA) and Office of Secretary of the Air Force/Financial Management (SAF/FM)

Performer: The Aerospace Corporation
MS: M4/021
P.O. Box 92957
Los Angeles, CA 90009-2957

S. A. Book, (310) 336-8655
E-mail: stephen.a.book@aero.org

Resources: FY Dollars Staff-years
 98 \$14,000 0.1

Schedule: Start End
 Dec 97 Feb 98

Data Base: None

Publications: S. A. Book and P. H. Young, "Validation Report on PLAN™ Risk Modeling Software," The Aerospace Corporation, 66 pages, 8 April 1992. (U.S. Government/FFRDC only).
 S. A. Book and E. L. Burgess, "Validation Report on CRYSTAL BALL Risk Modeling Software," The Aerospace Corporation, 74 pages, 5 January 1993. (U.S. Government/FFRDC only).
 S. A. Book, N. R. Chunduri, and P. H. Young, "Validation Report on RISK Risk Modeling Software," The Aerospace Corporation, 58 pages, 19 March 1993. (U.S. Government/FFRDC only).
 S. A. Book, N. R. Chunduri, and P. H. Young, "Validation Report on @RISK Risk Modeling Software," The Aerospace Corporation, 78 pages, 6 April 1993. (U.S. Government/FFRDC only).
 S. A. Book, O. F. Blackshire, and P. H. Young, "Validation Report on RISK+ Risk Modeling Software for Microsoft Project 4.0," The Aerospace Corporation, 141 pages, 6 October 1995. (U.S. Government/FFRDC only).
 C. J. Latta, O. F. Blackshire, and S.A. Book, "Evaluation Report on Risk Driver: A Tool for Preemptive Project Risk Management," The Aerospace Corporation, 110 pages, 2 February 1998. (U.S. Government/FFRDC only).

Categories: I.C.2, II.D

Keywords: Government, Estimating, Risk/Uncertainty, Mathematical Modeling, Review

AERO-3

Title: Small-Satellite Cost Engineering Model

Summary: Integration of physical, engineering, and cost relationships, encompassing new generation of low-weight, single-purpose, short-lifetime tactical satellites. Goal is to allow analyst to investigate in real time cost impacts of performance changes.

Classification: Unclassified, Government-only, Contractor-Proprietary Data

Sponsor: NASA Jet Propulsion Laboratory

Performer: The Aerospace Corporation
 MS: M4/939
 P.O. Box 92957
 Los Angeles, CA 90009-2957
 A. B. Dawdy, (310) 336-6134
 V. M. Canales, (310) 336-8350

Resources: FY Dollars Staff-years
 98 \$100,000 0.6

Schedule: Start End
 Jan 94 None (Maintenance ongoing)

Data Base: Recent historical costs and technical parameters of new generation of small satellites and launch vehicles.

Publications: D. A. Bearden, E. L. Burgess, and N. Y. Lao, "Small-Satellite Cost Study," The Aerospace Corporation, publicly releasable briefing containing no proprietary information.

K. D. Bell, A. B. Dawdy, and L. A. Hsu, "Cost-Effective Concept Definition Using an Integrated Cost Engineering Model Process," The Aerospace Corporation.

Categories: I.B, II.A.2, II.C, II.D

Keywords: Government, Estimating, Space Systems, Production, Engineering, Data Collection, Computer Model

AERO-4

Title: Small-Satellite Cost Study

Summary: Data gathering and CER development, encompassing new generation of low-weight, single-purpose, short-lifetime tactical satellites. Implemented in test-and-evaluation version of computer model. Assist NASA HQ in non-advocate reviews of Center-initiated funding proposals.

Classification: Unclassified; Government-only, Contractor-Proprietary Data

Sponsor: NASA Langley Research Center

Performer: The Aerospace Corporation
MS: M4/021
P.O. Box 92957
Los Angeles, CA 90009-2957
T. J. Mosher, (310) 336-1203
N. Y. Lao, (310) 336-7876

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$60,000 | 0.3 |

Schedule: Start End
Jan 91 None (maintenance and upgrades ongoing)

Data Base: Recent historical costs and technical parameters of new generation of small satellites and launch vehicles.

Publications: "Small-Satellite Cost Study," publicly releasable briefing containing no proprietary information.

Categories: I.B, II.A.1, II.B, II.D

Keywords: Government, Estimating, Space Systems, Production, Engineering, Data Collection, Data Base, Computer Model, CER

AERO-5

Title: Ground Systems Cost Model (G-Cost)

Summary: Joint project with The MITRE Corporation's Economic and Decision Analysis Center, Bedford, MA 01730. Model costs of ground systems hardware, software, operations, and maintenance. Derive CERs from historical data when available, from vendor quotes when

appropriate. Include satellite control facilities and equipment, communications equipment, launch processing, and security needs (see MITRE-2).

Classification: Unclassified, some Contractor-Proprietary Data

Sponsor: Aerospace Corporation Internal Research and Development (IR&D) Program

Performer: The Aerospace Corporation
MS: M4/021
P.O. Box 92957
Los Angeles, CA 90009-2957
L. B. Sidor, (310) 336-1571

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$50,000 | 0.4 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 97 | Sep 98 |

Data Base: Cost and technical data

Publications: A. J. Matthews, "A Ground Cost Model (G-COST) for Military Systems," AIAA, 28 February 1996.

Categories: II.A, II.C

Keywords: Government, Estimating, Facilities, Manpower/ Personnel, Life Cycle, Labor, Fixed Costs, Variable Costs, Data Collection, Statistics/Regression, Computer Model

AERO-6

Title: Formation of Corporate Concept Design Center

Summary: Establish central focal point for applying distributed concurrent-engineering methodology to utilize broad engineering expertise and in-house cost and performance models to produce conceptual designs for space, launch, and ground systems. Rapid development of system designs in response to performance-requirement adjustments will allow quick-turnaround system- and component-level performance assessment and life-cycle-cost analysis.

Classification: Unclassified

Sponsor: The Aerospace Corporation's Research Program

Performer: The Aerospace Corporation
MS: M4/021
P.O. Box 92957
Los Angeles, CA 90009-2957
A. B. Dawdy, (310) 336-6134
V. M. Canales, E. T. Davalos; (310) 336-8222

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 98 | \$200,000 | 1.1 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 96 | Sep 97 |

Data Base: None.

Publications: None as yet

Categories: II.B, II.C, II.D

Keywords: Government, Estimating, Space Systems. Concept Development, Engineering, Mathematical Modeling, Computer Model

MITRE CORPORATION

| | | |
|-----------------|---|----------|
| Name | The MITRE Corporation The Economic and Decision Analysis Center (EDAC) | |
| Address | 1820 Dolley Madison Boulevard McLean, VA 22102 | |
| Director | Dr. William Hutzler, (703) 883-6911 | |
| Size | Professional: | 85 |
| | Support: | 10 |
| | Consultants: | 0 |
| | Subcontractors: | 0 |
| Focus | Applied economic analysis, cost analysis, decision support, acquisition analysis, nondevelopmental item acquisition, program management, risk management and analysis, life cycle management, logistics engineering, business process reengineering, business and technology case analysis, and information services and technology benchmarking. | |
| Activity | Number of projects annually: | 180 |
| | Average duration of a project: | 6 months |
| | Average number of staff members assigned to a project: | 2 |
| | Average number of staff-years expended per project: | 0.5 |
| | Percentage of effort conducted by consultants: | 0% |
| | Percentage of effort conducted by subcontractors: | 0% |

MITRE-1

Title: A Predictive Pricing Model for Asynchronous Transfer Mode (ATM) Public Services

Summary: The telecommunications industry is evolving toward powerful gigabit networks that support diverse technologies and applications. ATM, with its capability to integrate multimedia (voice, data, and video) on the same transmission facility, is the technology of choice for telecommunications upgrades, particularly in wide-area-networks (WANs). In addition, the Government trend toward purchasing services as opposed to owning or leasing networks is growing. Currently, there is little pricing information available for the higher bandwidths, which will eventually be offered by ATM public services, such as OC12 and OC48. This is compounded by the lack of any commercially available predictive telecommunications pricing tools. When the eventual technology delivery lags the need for pricing information by several years, this lack of analytical resources makes it very difficult to predict the costs of telecommunications services acquisitions in the early stages of an acquisition, which is precisely when this information is most needed. This research project addresses that information gap with a rough-order-of-magnitude predictive pricing model for ATM public services for higher bandwidths that are not yet commercially available.

Classification: Unclassified

Sponsor: MITRE Economic and Decision Analysis Center

Performer: MITRE

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | | | 5 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Jan 97 | Aug 97 |

Data Base: Proprietary

Publications: Internal

Category: II.B

Keywords: Industry, Estimating, Electronics/Avionics, Advanced Technology, Mathematical Modeling, Mathematical Model

MITRE-2 MITRE CORPORATION 100 N. 3rd St., Suite 200, Bedford, MA 01730 617-552-3900 www.mitre.org

Title: G-Cost Model

Summary: The objective of this research is to create a viable SATCOM ground station cost model to support cost and acquisition planning for MITRE work programs. The work breakdown structure (WBS) consists of antenna; receiver; transmit; power; control & status (C&S); facilities; security; communication; telemetry, tracking & control (TT&C); and personnel. The WBS is supported by 25 cost drivers with 21 additional sub-cost driver options. The results are programmed into a user-friendly Excel model supported by Access database.

Classification: Classified

Sponsor: MITRE Sponsored Research

Performer: MITRE

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | | \$100K | |

Schedule: Start End
 Jan 97 Dec 97

Data Base: Proprietary

Publications: None

Category: II.B

Keywords: Estimating, Analysis, Space Systems, Life Cycle, Risk/Uncertainty, Data Collection, Mathematical Modeling, Mathematical Model

MITRE-3

Title: Trends in the Development of Optoelectronics over the Next Ten to Fifteen Years

Summary: This study examines key trends in the growth of optoelectronics on a worldwide basis, including estimates of the cost and other economic drivers that are spurring and inhibiting the development of optoelectronics over the near term future.

Classification: Unclassified

Sponsor USGC

Performer: MITRE

Resources: FY Dollars Staff-years
 97 \$156,000 1.5

Schedule: Start End
 Oct 96 Apr 97

Data Base: None

Publications: Optoelectronics: An Assessment Of Key Trends

Category: II.D

Keywords: Estimating, Analysis, Electronics/Avionics, Case Study

RAND CORPORATION

| | | | |
|-----------------|---|----------|--|
| Name | RAND Corporation | | |
| | Note: There is no formal cost research organization at RAND. Cost analysts are members of the management science group and, like all other research staff members, are assigned to projects in the various divisions (Project Air Force, Arroyo Center, National Defense Research Institute, other domestic). | | |
| Address | 1700 Main Street Santa Monica, CA 90407-2138 | | |
| Director | Frederick S. Timson, (310) 393-0411, ext. 7802 | | |
| Size | Professional: | 8 | |
| | Support: | 0 | |
| | Consultants: | 0 | |
| | Subcontractors: | 0 | |
| Focus | Force costing, O&S costing, system costing, and space systems. | | |
| Activity | Number of projects in process: | 3 | |
| | Average duration of a project: | 1-2 year | |
| | Average number of staff members assigned to a project: | 1-3 | |
| | Average number of staff-years expended per project: | 0.5 to 4 | |
| | Percentage of effort conducted by consultants: | 0% | |
| | Percentage of effort conducted by subcontractors: | 0% | |

RAND-1

Title: Force Structure and Support Infrastructure Costing for Program Analysis and Evaluation

Summary: The objective of this research is to design, develop, and implement an automated system for costing force structure and related changes in defense programs. The project will include recommendations for developing a centralized database within PA&E to support the costing system

Classification: Unclassified

Sponsor: OD(PA&E)

Performer: RAND
Adele Palmer, (310) 393-0411 (Co-PI); Jim Bigelow, (310) 393-0411 (Co-PI);
Manuel Carrillo, (310) 393-0411; Gary Massey, (310) 393-0411

Resources: FY Dollars Staff-years

Schedule: Start End
Dec 90 Continuing

Data Base: *Title:*
Description:
Automation:

Publications: *The Force Structure Costing Project: An Introductory Briefing*, WD-5252-PA&E, Adele Palmer, December 1990, Unclassified (distribution of RAND WDs controlled by sponsor)

Category: II.C

Keywords: Government, Estimating, Analysis, Programming, Forces, Expert System, Method, Computer Model

RAND-2

Title: The Cost of Future Military Aircraft: Historical Cost Estimating Relationships and Cost Reduction Initiatives

Summary: The project will update three previous RAND studies involving the cost of advanced airframe materials, airframe cost estimating relationships based on historical data, and Very High Speed Electronics avionics costs. It will also assess how new industrial and management practice affect aircraft costs, survey and update operating and support cost estimating methodologies, and update electronics, propulsion, and other subsystem cost estimating methodologies. [This is a new task in FY 1998 and incorporates the Advanced Airframe Structural Materials task reported as RAND-3 in the 1997 catalog.]

Classification: Unclassified

Sponsor: SAF/AQ/FM and OD(PA&E)

Performer: RAND
Points of Contact: Dr. Michael Kennedy (310) 393-0411 Ext. 7650; Jack Graser (202) 296-5000 Ext. 5293

Resources: FY Dollars Staff-years
98-99 6 MTS

Schedule: *Start* *End*
 Jan 98 Continuing

Data Base: No separate database anticipated. Reports will have CERs/adjustment factors in the body of the text, with details in appendices.

Publications: Separate RAND reports anticipated for each major area.

Categories: II.A.1, II.A.2

Keywords: Industry, Estimating, Airframe, Propulsion, Electronics/Avionics, EMD, Production, Operations and Support, Engineering, Manufacturing, Material, Acquisition Strategy, Automation, Advanced Technology, Data Collection, Survey, Statistics/Regression, Method, CER, Study

LOGISTICS MANAGEMENT INSTITUTE

| | | | |
|-----------------|--|--|--------|
| Name | Logistics Management Institute | | |
| Address | 2000 Corporate Ridge McLean, VA 22102-7805 | | |
| Director | Mr. Walter R. Cooper, (703) 917-7242 | | |
| Size | Professional: | | 9 |
| | Support: | | 1 |
| | Consultants: | | 0 |
| | Subcontractors: | | 0 |
| Focus | Infrastructure, Weapon Systems | | |
| Activity | Number of projects in process: | | 10 |
| | Average duration of a project: | | 1 year |
| | Average number of staff members assigned to a project: | | 1-2 |
| | Average number of staff-years expended per project: | | 1 |
| | Percentage of effort conducted by consultants: | | 0% |
| | Percentage of effort conducted by subcontractors: | | 0% |

LMI-1

Title: Empirical Analysis of Learning Curves

Summary: Reductions in scale of the Defense budget, advances in manufacturing technologies, and acquisition reform will all affect the costs of future acquisitions. The sensitivity of cost estimates to underlying assumptions becomes of greater importance during this period of transition. This task is examining these issues from an empirical perspective and is building analytical tools to assist analysts in the CAIG in preparing their independent estimates. Initially, this research program addressed tactical missiles; research is now focusing on the development of alternative models and testing those models with military electronics programs.

Classification: Unclassified

Sponsor: Weapon System Cost Analysis Division, OD (PA&E)
Lieutenant Colonel David Nicholls, (703) 695-7282

Performer: LMI
Ken Notis, (703) 917-7171; Virginia Stouffer, (703) 917-7167; Dr. David Lee, (703) 917-7557

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | \$200K | 1.0 |
| 97 | \$168K | 0.85 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Apr 96 | Aug 98 |

Data Base: We are creating no new data bases in this project.

Publications: Cooper, W. R., J. S. Domin, R. M. Feinberg, J. P. Johnson, D. A. Lee, and T. P. Lyon, "Empirical Analysis of Cost Progress Curves: Tactical Missiles." LMI Report PA603T1, October 1997.

Categories: I.A, II.A.2, II.C, II.D

Keywords: Industry, Estimating, Missiles, Electronics/Avionics, Production, Manufacturing, Acquisition Strategy, Data Collection, Cost/Production Function, Statistics/Regression, Study

LMI-2

Title: Improved Methodologies for Estimating Development Costs

Summary: This study is surveying best practices in organizing and executing programs and in estimating the costs of planned development projects for large-scale product developments in commercial and Defense industries. The effort will identify the applicability of available product development cost estimation methodologies to different DoD product sectors and recommend best practices for improving estimates of development costs for key DoD product sectors. LMI will host a series of seminars that will bring together developers and cost analysts to identify major cost drivers of today's development programs. The first seminar, scheduled for August 1998, will concentrate on development of new receivers for the Global Positioning System.

Classification: Unclassified

Sponsor: Director, Operations Analysis and Procurement Planning Division, OD (PA&E)
Mr. Steve Miller, (703) 697-0307

Performer: LMI
Gerry Belcher, (703) 917-7073; Dr. David Lee, (703) 917-7557

Resources: FY Dollars Staff-years
 98 \$250K 1.3
 99 \$300K 1.6

Schedule: Start End
 Mar 98 Mar 00

Data Base: No data bases will be created as a result of this work program.

Publications: A final report will be published upon completion of the analyses

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression

LMI-3

Title: Applying Advanced Tools for Analysis of Program Management

Summary: It has been observed that well-managed research and development programs absorb resources in a pattern that appears to follow a Rayleigh probability distribution. Recently, a technique was developed to obtain probability distributions on the parameters of the Rayleigh model using multiple model adaptive estimation (MMAE). This task provides a computer model that conveniently accesses the results of MMAE and other appropriate methods for identifying Rayleigh parameters from data on programs' actual cost of work performed.

Classification: Unclassified

Sponsor: Deputy Director, Performance Measurement, Acquisition Program Integration, OUSD(A&T)
 Reed White, (703) 695-5166

Performer: LMI
 Dr. David Lee, (703) 917-7557; John Dukovich, (703) 917-7512

Resources: FY Dollars Staff-years
 97 \$50K 0.3

Schedule: Start End
 Jun 97 Mar 98

Data Base: No new data bases were developed; however, three data tables from the Contract Analysis System (CAS) database are combined and reduced to produce a database internal to the model.

Publications: Lee, D. A. and J. Dukovich, "Using the Rayleigh Analyzer: Beta Test Version." LMI Report AT701C1, March 1998.

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression, Computer Model

LMI-4

Title: Enhancing Resource Analysis

Summary: In an effort to advance the state of knowledge and practice in the resource analysis community, this project supported the publication of two books. The first, The Cost Analyst's Companion by Dr. David Lee, is derived from a series of lectures he presented to analysts in the OSD Cost Analysis Improvement Group (CAIG). The book addresses a number of topics important to cost analysts: cost progress curves, cost estimating relationships, advanced techniques in evaluating the costs of

development programs, and the use of engineering and statistical considerations for estimating operating and support costs. The second, The OSD Cost Analysis Improvement Group: A History, edited by Don Srull, reviews the history of the CAIG over the 25 years since it was established.

Classification: Unclassified

Sponsor: Joint between Independent Research and Development and the Deputy Director (Resource Analysis), OD(PA&E)
Dr. Dave Gallagher, (703) 695-2612

Performer: LMI
Dr. David Lee, (703) 917-7557; John Dukovich, (703) 917-7512; Don Srull, (703) 917-7235; Virginia Stouffer, (703) 917-7167

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$100K | 0.5 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Aug 97 | Feb 98 |

Data Base: No new data bases were developed.

Publications: Lee, D. A., "The Cost Analyst's Companion." The Logistics Management Institute, McLean, VA, 1997.
Srull, D., Editor, "The Cost Analysis Improvement Group: A History." The Logistics Management Institute, McLean, VA, 1998.

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression, Computer Model

LMI-5

Title: Weapon System Total Life Cycle Costs: A Management-Oriented Cost Accounting System

Summary: In this study, LMI is assisting in the surveying of the Military Departments' efforts to institute activity based accounting and management by consolidating and evaluating input, focusing on those efforts directly related to weapon systems. The study is also addressing the extent to which VAMOSC and other Service-run cost of ownership initiatives may be constructive starting points for a new cost accounting system and/or its components.

Classification: Unclassified

Sponsor: Deputy Director, Performance Measurement, Acquisition Program Integration, OUSD(A&T)
Mr. Gary Christle, (703) 695-5166

Performer: LMI
John Wallace, (703) 917-7239

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$175K | 0.9 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct 97 | Oct 98 |

Data Base: No data bases will be created as a result of this work program.

Publications: A final report will be published upon completion of the analyses.

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Data Collection

LMI-6

Title: Metrics for Business Area Programming

Summary: The Director, Program Analysis and Evaluation has been taking steps to improve the visibility of working capital funds. For one, the office has established a requirement for the components to include business plans for selected support organizations in the Defense Program Review. This study is identifying potential performance metrics that will assist in the evaluation of these business areas. Initial focus: depot maintenance.

Classification: Unclassified

Sponsor: Director, Force and Infrastructure Cost Analysis Division, OD (PA&E).
Commander Bill Munson, (703) 697-4311

Performer: LMI
Dr. Dale Kem, (703) 917-7225; Mel Etheridge, (703) 917-7307; Ken Notis, (703) 917-7171

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$150K | 0.75 |
| 98 | \$200K | 1.0 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct 97 | Mar 99 |

Data Base: No data bases will be created as a result of this work program.

Publications: A final report will be published upon completion of the analyses

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Forces, Infrastructure, Fixed Costs, Variable Costs, Data Collection, Mathematical Modeling, Statistics/Regression

LMI-7

Title: Understanding the Costs of Logistic Support and Interoperability for NATO Enlargement

Summary: This study is addressing the costs of enlarging NATO, with special emphasis on logistics and interoperability problems and programs. The study is focusing on characterizing the current logistics support programs in the newly-invited states (Poland, Czech Republic, and Hungary), working with the three newly-invited states to identify incremental logistics support needs, and developing a framework for developing budgets to support the additional needs. The study is also investigating the implications of expanding NATO from the perspective of interoperability, especially with respect to command and control.

Classification: Unclassified

Sponsor: Regional Assessment and Modeling Division, OD (PA&E).
Dr. Royce Kneese, (703) 695-7835

Performer: LMI
Dr. Dale Kem, (703) 917-7225

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$300K | 1.6 |

Schedule: Start End
 Oct 97 Oct 98

Data Base: No data bases will be created as a result of this work program.

Publications: A final report will be published upon completion of the analyses

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression

LMI-8

Title: Improving DBOF Pricing

Summary: This study is providing a better understanding of the impact of various pricing problems on the resource requirements for infrastructure activities. The project will select a sample of depot-level repairables (DLRs) for each Military Service that have experienced the largest base-level repair elasticities with DBOF prices, analyze those items to determine the number and dollar value of uneconomic repair decisions, and extrapolate the sample results from each Service to the entire set of DLRs.

Classification: Unclassified

Sponsor: Director, Force and Infrastructure Cost Analysis Division, OD (PA&E).
 Mr. Don Tison, (703) 695-4177

Performer: LMI
 John Wallace, (703) 917-7239

Resources: FY Dollars Staff-years
 96 \$200K 1.0

Schedule: Start End
 Feb 96 Sep 98

Data Base: We envision publishing a data base at the end of this project

Publications: A final report will be published upon completion of the analysis

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Forces, Infrastructure, Operations and Support, Fixed Costs, Variable Costs, Data Collection, Mathematical Modeling, Statistics/Regression

LMI-9

Title: Analysis of Institutional Training Resources

Summary: Institutional training is a \$14 billion-a-year program in the Department of Defense. This work program is developing tools to assist senior analysts exercise their staff oversight responsibilities. The research focuses on the relationship between resources (fiscal, manpower and physical) and levels of training activity. In recent years, the focus has shifted to understanding the implications of outsourcing institutional training and on developing methods for assessing the economic impacts of investments in advanced training technologies.

Classification: Unclassified

Sponsor: Readiness and Training Directorate, OUSD (Readiness)

Mike Kendall, (703) 697-4992

Performer: LMI
Virginia Stouffer, (703) 917-7167

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 94 | \$400K | 2.0 |
| 95 | \$250K | 1.3 |
| 96 | \$200K | 1.0 |
| 97 | \$225K | 1.3 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Apr 94 | Oct 98 |

Data Base: Tools under construction use several existing data bases, including training load and workload files furnished by the Defense Manpower Data Center, the FYDP, and other data bases containing information on end strengths.

Publications: Esmann, W. J., W. R. Cooper, and M. R. Etheridge, "Analysis of Training Installations - A System." LMI Report PR401RD1, April 1995.

Esmann, W. J., and J. Jennings, "Calculating Marine Corps Range and Maneuver-Area Requirements." LMI Report PR401LN1, November 1995.

Esmann, W. J., "Opportunities for Privatizing DoD Education and Training." LMI Report EC508LN5, October 1996.

Esmann, W. J., "A Process for Outsourcing Department of Defense Education and Training." LMI Report EC508LN1, April 1996.

Fuller, M. D., D. A. Lee, W. J. and Esmann, "Returns on Investment for Navy Enlisted Training." LMI Report FP209T1, July 1997

V. Stouffer, "A Database for Decision-Making in Training and Distributed Learning Technology." LMI Report PR702T1, April 1998.

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Forces, Infrastructure, Manpower/Personnel, Operations and Support, Fixed Costs, Variable Costs, Training, Data Collection, Mathematical Modeling, Statistics/Regression, Computer Model

LMI-10

Title: Accrual Accounting for Post-Retirement Military Health Care

Summary: In this study, LMI is assisting the DoD actuary in collection, processing and analysis of data related to changes in the Military Health Services System. LMI is also assisting the Office of the Actuary in analyzing the effects of introducing the TriCare program on the demands and costs for retirement health care benefits.

Classification: Unclassified

Sponsor: Deputy Under Secretary of Defense, Program Integration, OUSD (P&R)
Ms. Penny Westmoreland, (703) 696-4110

Performer: LMI
Mel Etheridge, (703) 917-7307; Hong Le, (703) 917-7139

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$150K | .7 |

Schedule: Start End
 Oct 97 Oct 98

Data Base: No data bases will be created as a result of this work program.

Publications: A final report will be published upon completion of the analyses

Category: II.A

Keywords: Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression

INSTITUTE FOR DEFENSE ANALYSES

| | | |
|------------------------|--|--------|
| <i>Name</i> | Institute for Defense Analyses | |
| <i>Address</i> | 1801 N Beauregard Street Alexandria, VA 22311 | |
| <i>Director</i> | Dr. Stephen J. Balut, (703) 845-2527, E-mail: sbalut@ida.org | |
| <i>Size</i> | Professional: | 40 |
| | Support: | 5 |
| | Consultants: | 40 |
| | Subcontractors: | 1 |
| <i>Focus</i> | Cost of Weapon Systems, Forces and Operation | |
| <i>Activity</i> | Number of projects in process: | 40 |
| | Average duration of a project: | 1 year |
| | Average number of staff members assigned to a project: | 2-4 |
| | Average number of staff-years expended per project: | 2 |
| | Percentage of effort conducted by consultants: | 30% |
| | Percentage of effort conducted by subcontractors: | 2% |

IDA-1

Title: Defense Resource Management Cost Model

Summary: Develop a computer model that permits small—to medium-size countries to estimate the funding requirements of alternative, multi-year force compositions. The model provides cost estimates that are sensitive to the following force characteristics: numbers and types of combat and support units, numbers and types of equipment, unit manning, peacetime training levels (OPTEMPO), equipment modernization, and WRM inventory changes. The model can be tailored to use the currencies, cost accounts, personnel classifications, and a wide variety of force and equipment configurations of any military force. Cost modeling provides the ability to estimate the direct and indirect personnel costs, fixed and variable operating costs, and multi-year procurement funding. Users have convenient access to all characteristics of the model so they can adjust the model's use to their own practices. Effort includes travel to foreign countries to implement the model as part of the Partnerships for Peace program.

Classification: Unclassified

Sponsor: OD(PA&E), Regional Assessment and Modeling Division
The Pentagon, Rm. 2C270
Washington, DC 20301
COL Gary Morgan, (703) 697-6415

Performer: IDA
Mr. James L. Wilson, (703) 845-2469

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 93 | \$25,000 | 0.2 | 96 | \$1,000,000 | 6.8 |
| 94 | \$288,000 | 1.9 | 97 | \$1,000,000 | 6.8 |
| 95 | \$550,000 | 3.5 | 98 | \$1,100,000 | 6.9 |

Schedule: Start End
Sep 93 Indefinite

Data Base: None

Publications: DRMM Cost Modules Users Manual

Category: II.A.2

Keywords: Government, Programming, Forces, Life Cycle, Fixed Costs, Variable Costs, Mathematical Modeling, Computer Model

IDA-2

Title: FYDP Tracking and Analysis System

Summary: This task strengthens the DoD's capability to apply FYDP data when conducting analyses in support of PPBS processes through the development of a system of computer-based analytical tools. In FY 1995 the task was changed to support the development of a new operating environment for the IDA Force Acquisition Cost System series of computer-based models.

Classification: Secret

Sponsor: OD(PA&E), Force and Infrastructure Cost Analysis Division
The Pentagon, Rm. 2D278
Washington, DC 20301
Mr. Al Leung, (703) 697-4311

Performer: IDA

Mr. Timothy Graves, (703) 845-2339

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 93 | \$85,000 | 0.6 |
| 94 | \$150,000 | 1.2 |
| 97 | \$25,000 | 0.2 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Jul 93 | Sep 98 |

Data Base:

| | |
|---------------------|--|
| Title: | FYDP |
| Description: | FYDP type data for all DoD programs to include Program Element |
| Automation: | PC in FoxPro, Visual Basic, Excel, and Visual Basic |

Publications: TBD

Categories: II.A.1, II.A.2, II.B

Keywords: Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

IDA-3

Title: FYDP Related Studies

Summary: This task supports the conduct of studies to improve the existing FYDP-related taxonomy of missions and infrastructure and to maintain and utilize previously developed models for FYDP-related analyses.

Classification: Secret

Sponsor: OD(PA&E), Force and Infrastructure Cost Analysis Division
The Pentagon, Rm. 2D278
Washington DC 20301
Mr. Al Leung, (703) 697-4311

Performer: IDA
Mr. Timothy J. Graves, (703) 845-2339

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 92 | \$40,000 | 0.3 | 95 | \$130,000 | 1.0 |
| 93 | \$220,000 | 2.4 | 96 | \$150,000 | 1.2 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Sep 92 | Oct 99 |

Data Base:

| | |
|---------------------|--|
| Title: | AMORD, FYDP |
| Description: | FYDP type data for all DoD programs to include Defense Mission Categories, Program Element |
| Automation: | |

Publications: TBD

Categories: II.A.1, II.A.2, II.B

Keywords: Government, Programming, Forces, Mathematical Modeling, Computer Model

IDA-4

Title: Defense Programming Database

Summary: This task is to analyze and document the databases currently used to provide senior management and their staffs with the information necessary to make informed program

decisions, and to recommend improvements. The primary database used is the Future Years Defense Program (FYDP). Initially, support will to be provided to affect the transfer of responsibility for updating the FYDP from the Comptroller to PA&E. Following this, IDA will:

1. Formally evaluate the improvements made to the FYDP Update process that were implemented during the period when responsibility for the update was taken over by PA&E.
2. Recommend improvements to the FYDP data elements to make the database more useful for defense analyst. This work will focus on data elements that will make it possible to evaluate the effects of resource changes on readiness.
3. Recommend solutions for linking the FYDP database with other useful programming databases. In particular, this will involve reviewing the plan for integrating the data collected through the Advanced POM Preparation System (APPS) and the FYDP into the Defense Programming Database (DPD).
4. Other tasks will address a system for reporting DPD data, reviewing the current Defense Mission Category (DMC) and Infrastructure Category (IC) structures with recommendations for improving the assignments of program elements to "missions" in the IC structure. Other work will focus on the streamlining of the PPBS databases that will be a part of the DPD.

A DoD task force and the sponsor will approve products prior to implementation.

Classification: Unclassified work dealing with a classified database

Sponsor: OD(PA&E)
1800 Defense Pentagon
The Pentagon, Rm. 2D322
Washington, DC 20301-1800
Dr. Bryan Jack, (703) 693-7827

Performer: IDA
Mr. Paul Goree, (703) 845-2238

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 95 | \$340,000 | 2.2 |
| | 96 | \$550,000 | 3.5 |
| | 97 | \$475,000 | 2.9 |
| | 98 | \$325,000 | 2.0 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Jun 95 | May 99 |

Data Base: Title:
Description:
Automation: FYDP, APPS, DPD, MDAP

Publications: TBD

Categories: II.A, II.C, II.D

Keywords: Government, Programming, Forces, Infrastructure, Manpower/Personnel, Life Cycle, Automation, Data Collection, Data Base

IDA-5

Title: Science and Technology Models

Summary: In 1992, the Army began the development of a management information system for the management of their Science and Technology Programs. The program, initiated under a

separate task order that helped develop the Army's S&T Master Plan, was used by the headquarters and field laboratories to manage the S&T program. The Army Science and Technology Management Information System (ASTMIS) was a distributed application that required monthly updates to data used in the headquarters to manage the program. Using the program, headquarters analyst could assess the details of Army S&T projects and their contribution toward Army objectives. The success of the program was hampered by the distributed data arrangements. Currently, the program has been redesigned and will go on-line using a central server and database. Financial and descriptive information about projects, tasks and workpackages are available for review and modification. Reports and charts are available for reviewing the data.

Classification: Unclassified

Sponsor: DDR&E (Plans and Resources)
1800 Defense Pentagon
The Pentagon, Rm. 3D367
Washington, DC 20301-1800
Mr. Robert Tuohy, (703) 693-2978

Performer: IDA
Mr. Paul Goree, (703) 845-2238

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 96 | \$85,000 | 0.5 |
| | 97 | \$265,000 | 1.6 |
| | 98 | \$75,000 | 0.4 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Oct 96 | Sep 98 |

Data Base: **Title:** "ASTMIS"
Description: The ASTMIS data base is an Access data base that contains information about the Army's S&T Program.
Automation: Designed using COTS and desktop computers.

Publications: A users guide and model documentation will be prepared.

Category: II.A

Keywords: Programming, Budgeting, Data Collection, Computer Model, Data Base

IDA-6

Title: Contingency Operations Support Tool (COST)

Summary: The initial estimates of the cost to support military operations in Bosnia (Operation Joint Endeavor (OJE)) have proven to be significantly low. The DoD Deployment Model, used to estimate these costs, had been successfully used to estimate costs for other contingency operations in Haiti and Somalia. Cost estimates derived in this manner for the Bosnia operations were in error by over a factor of two. The first phase of this task examined the initial and subsequent estimates in an attempt to understand why the estimates erred by this amount. Problems were observed in three areas: (1) estimating; (2) operations or policy changes; and (3) not estimated. In this phase of the task, IDA will develop the Contingency Operation Support Tool (COST) for the OSD Comptroller to aid the analyst in the preparation of both planning and detailed estimates for future contingencies. A standard cost breakdown structure will be used for estimating and reporting costs for contingency operations. A logical data model has been developed and a physical model implemented to facilitate the construction of an estimate. COST is being developed using COTS. The concept of operation makes the application and its data available to approved users via the SIPRNet. Initial or planning estimates will be prepared by the OSD (C) and

passed to the Services and Agencies where a more detailed estimate can be made. Service and Agency estimates will be passed to OUSD(C) for inclusion in the official estimate for the contingency. Trial periods will be established to verify model operations. A task goal is to secure the endorsement by the OUSD(C), Joint Staff, and Military Departments to use the application for cost estimates during all contingency operations.

Classification: Unclassified

Sponsor: OUSD (Comptroller)
1800 Defense Pentagon
The Pentagon, Rm. 3D868
Washington, DC 20301-1800
Ms. Sallie Morse, (703) 697-9317, ext. 19

Performer: IDA
Mr. Paul Goree, (703) 845-2238

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 97 | \$450,000 | 2.7 |
| | 98 | \$500,000 | 3.1 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Dec 97 | Mar 99 |

Data Base: **Title:** "COST"
Description: The COST database is comprised of separate physical databases the are entitled, "Cost Systems, Cost Factors and Cost Standards, and Cost Contingencies.

Automation: Design will use COTS and desktop computers, possibly using Web technology.

Publications: A users guide and model documentation will be prepared.

Category: II.C

Keywords: Government, Estimating, Forces, Life Cycle, Computer Model, CER

IDA-7

Title: Trends in Weapons System O&S Costs

Summary: The objective of this task is to investigate available operating and support cost data to see if past efforts to reduce O&S costs have been effective. Results will be normalized, as much as possible, for changes in weapons capability, operating tempo, and economic inflation.

Classification: Secret

Sponsor: OUSD(A&T)(API)
The Pentagon, Rm. 1E466
Washington DC 20301
Mr. Phil Rodgers, (703) 697-6070

Performer: IDA
Mr. Timothy J. Graves, (703) 845-2239

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 96 | \$100,000 | 0.8 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Jul 96 | Jun 98 |

Data Base: **Title:** VAMOSOC data, Service OPTEMPO data

Description: FYDP type data for all DoD programs to include Defense Mission Categories, Program Element, Procurement Annex Line Item

Automation:

Publications: "Trends in Weapons System O&S Costs", Unclassified, Draft Final, October 1997.

Category: II.C

Keywords: Government, Estimating, Forces, Life Cycle, Computer Model, CER

IDA-8

Title: Operations and Maintenance (O&M) Funding Migration

Summary: The objective of this task is to identify the magnitude of funding shifted from investment to O&M accounts during budget formulation and execution historically and, where possible, identify the reasoning which resulted in understating of future O&M requirements. This original objective was satisfied and the QDR utilized this information to direct the services to more fully program for future O&M needs. Furthermore, the Secretary established a future investment set aside account. The new objective is to support API/AR with FYDP related studies as required.

Classification: Secret

Sponsor: OUSD(A&T)/API/AR
The Pentagon, Rm. 1E474
Washington, DC
Mr. Phil Rodgers, (703) 697-6070

Performer: IDA
Mr. Timothy J. Graves, (703) 845-2339

Resources:

| | | |
|-----------|----------------|--------------------|
| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| 97 | \$100,000 | 0.8 |

Schedule:

| | |
|--------------|------------|
| <u>Start</u> | <u>End</u> |
| Jan 97 | Jun 98 |

Data Base: *Title:* DoDSPEAR
Description: The DoDSPEAR (DoD Selective Program Element Analysis Report) model data base contains FYDP data by budget formulation position (POM, BES, PB) from the FY82 PB and forward.
Automation: FoxPro, dBASE, Visual Basic

Publications: None

Categories: II.A.1, II.A.2, II.B

Keywords: Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Computer Model

IDA-9

Title: Assessing Defense Funding Supporting Readiness

Summary: Maintaining the readiness of U.S. defense forces is one of the highest budgetary priorities of the Department of Defense. In order to do this, analysts and senior defense executives must be able to evaluate defense budgets and the FYDP to determine if they provide adequate funding for the desired level of readiness. A major portion of this research is identifying and quantifying the accounting changes that have occurred in DoD funding policies over the past two decades. The research also is developing a methodology for

identifying the portions of the defense program that have the most impact on readiness and is developing alternative metrics that describe changes in defense force size.

Classification: Secret

Sponsor: Deputy Under Secretary of Defense (Readiness)
Director for Readiness and Training
The Pentagon, Rm. 1C757
Washington, DC 20301
COL Charles Mitchell, (703) 697-4992

Performer: IDA
Mr. Stanley A. Horowitz, (703) 845-2450

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 95 | \$300,000 | 1.9 |
| | 96 | \$400,000 | 2.5 |
| | 97 | \$350,000 | 2.2 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Oct 94 | Dec 98 |

Data Base: FYDP Funding Adjustments

Publications: "Normalizing the Future Years Defense Program for Funding Policy Changes," Paper P-3194, Institute for Defense Analyses, January 1997.

Categories: II.A.1, II.A.2, II.B

Keywords: Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Computer Model

IDA-10

Title: Force Modernization Metrics

Summary: In building the Defense Program Projection, which looks at prospective defense spending twelve years beyond the end of the FYDP, tools are needed to present ways in which the force will be evolving. Building such tools is the central job of this task. In addition to tracking force age and capital asset value, attention will be devoted to developing indicators of capability for various missions and classes of systems to allow projections of capability to be made for alternative defense programs. The recapitalization of defense facilities will also be addressed.

Classification: Secret

Sponsor: Deputy Director (General Purpose Programs) Program Analysis and Evaluation
The Pentagon, Rm. 2E330
Washington, DC 20301
Mr. Will Jarvis, (703) 697-9132

Performer: IDA
Mr. Stanley A. Horowitz, (703) 845-2450

| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-------------------|-----------|----------------|--------------------|
| | 97 | \$340,000 | 2.2 |
| | 98 | \$360,000 | 2.3 |

| Schedule: | <u>Start</u> | <u>End</u> |
|------------------|--------------|------------|
| | Oct 96 | Dec 99 |

Data Base: Equipment inventories over time and potential capability measures. Age and plant replacement value of facilities by type and location.

Publications: TBD
Categories: II.B, II.C
Keywords: Government, Analysis, Review, Policy, Programming, Forces, Life Cycle, Data Collection, Time Series, Data Base, Computer Model, Study

IDA-11

Title: Non-major Procurement Funding

Summary: The objective of this task is to investigate available procurement data to determine the adequacy of non-major procurement funding in the FYDP and Defense Program Projection (DPP) periods and to assess the completeness and the fidelity of the MDAP supplemental data submissions. High-level relationships between non-major procurement funding levels and other FYDP funding/manpower levels have been analyzed using FY98 PB DPP data. Note: the Major Defense Acquisition Programs (MDAP) Reporting task was merged with this task in FY98.

Classification: Secret

Sponsor: OUSD(A&T)/API/AR
 The Pentagon, Rm. 1E474
 Washington, DC 20301
 Mr. Steve Dratter, (703) 697-8020
 LTC Daniel Cuda, (703) 697-1786

Performer: IDA
 Mr. David A. Drake, (703) 845-2573

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$50,000 | 0.4 |
| 98 | \$50,000 | 0.4 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Jan 97 | Sep 98 |

Data Base:

Title: Min_PROC data

Description: FYDP type data for all DoD Procurement programs to include Defense Mission Categories, Program Element, Procurement Annex Line Item for all procurement funding that is not in the DPP detail.

Automation: FoxPro, dBASE

Publications: TBD

Categories: II.A.1, II.A.2, II.B

Keywords: Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Statistics/Regression, Computer Model

IDA-12

Title: Program Objective Memorandum (POM) Major Defense Acquisition Programs (MDAP) Reporting

Summary: The objective of this task is to examine the Program Element and Procurement Annex Line Item (PE-PALI) Crosstrack and RDT&E project level data reporting requirements to ensure all Major Defense Acquisition Program (MDAP) reporting requirements can be met with these data. Modifications to the reporting requirements will be proposed as necessary. Programs will be developed to process the raw data into usable formats, check for errors, and build MDAP funding profiles. MDAP reporting in the FY98 PB

supplemental submissions have been analyzed and FoxPro programs to process the raw PE-PALI Crosstrack and RDT&E project level data into desired formats have been written.

Classification: Secret

Sponsor: OUSD(A&T)/API/AR, Acquisition Resources
The Pentagon, Rm. 1E474
Washington, DC 20301
Mr. Steve Dratter, (703) 697-8020

Performer: IDA

Mr. David A. Drake, (703) 845-2573

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$25,000 | 0.2 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Jan 97 | Sep 98 |

Data Base: Title: MDAPs

Description: FYDP type data for all DoD RDT&E and Procurement programs to include Defense Mission Categories, Program Element, Procurement Annex Line Item, and MDAP Identifier.

Automation: FoxPro, dBASE

Publications: None

Categories: II.A.1, II.A.2, II.B

Keywords: Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Statistics/Regression, Computer Model

IDA-13

Title: Force Aging

Summary: This task has four subtasks: (1) developing data bases and an aging model to assess the effects of aging force structure during the period of the Defense Program Projection; (2) performing case studies of selected weapon systems (i.e., F-16 Service Life and Resource Requirements) and types of weapon systems (i.e., vehicles and Army helicopters); (3) assessing the effects of re-engineering the B-52H; and (4) developing a facilities aging model. Relative to the data bases and tools, the initial focus has been on collecting data on equipment inventories and creating a capital stock data base. The primary case study has been on the F-16, assessing service life and resource requirements needed until the Joint Strike Fighter deploy. The next class of system to be reviewed will be tracked vehicles.

Classification: Secret

Sponsor: OD(PA&E) and USD(A&T)

Performer: IDA

Mr. Waynard C. Devers, (703) 845-2252

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 94 | \$53,000 | 0.4 |
| | 95 | \$200,000 | 1.3 |
| | 96 | \$310,000 | 2.0 |
| | 97 | \$255,000 | 1.6 |

Schedule: Start End
 Jan 95 Jun 98

Data Base: Title:
 Description: Equipment data bases, including inventory, age, service life, and operating tempo by serial number for Army, Navy, Marine Corps and Air Force aircraft, combat vehicles, and selected trucks; and capital stock data base, for selected equipment. Facilities data base, including inventories by facilities categories, age, installation, plant replacement value, target replacement life, and, for selected facilities condition, and readiness codes.

Automation: Equipment Data Base—FoxPro, Capital Stock Data Base—Excel, Facilities Data Base—FoxPro

Publications: Multiple papers providing the results of case studies.

Categories: I.B.1, II.B, II.C

Keywords: Forces, Weapon Systems, Aircraft, Helicopters, Ships, Land Vehicles, Facilities, Life Cycle, Production, Data Collection, Mathematical Modeling, Data Base, Case Study

IDA-14

Title: USMC Utility Rotary Wing Aircraft

Summary: This task provides operating and support costs estimates for selected USMC utility rotary wing aircraft.

Classification: Unclassified

Sponsor: OD(PA&E)

Performer: IDA
 Mr. Waynard C. Devers, (703) 845-2252

Resources: FY Dollars Staff-years
 96 \$75,000 0.5

Schedule: Start End
 Nov 95 Apr 98

Data Base: Title:
 Description: Operating and support cost data bases, including inventory, operating tempo, cost drivers and cost factors for Marine Corps utility rotary wing.

Automation: Data Base—Excel

Publications: Report due at completion of study with data bases.

Categories: I.B.1, II.A.1

Keywords: Government, Estimating, Forces, Weapon Systems, Helicopters, Operations and Support, Data Collection, Data Base, Case Study

IDA-15

Title: Rotary Wing Aircraft Recapitalization Analyses

Summary: Concepts for future rotary wing aircraft systems envision filling the force structure using fewer platforms types. Given this, there are many possible approaches to current and planned rotary wing platforms to accommodate the eventual transition to fewer platform

types. The objective of this task is to analyze the affordability implications of various rotary wing aircraft recapitalization strategies.

Classification: Unclassified

Sponsor: Office of the Director for Force Structure, Resource and Assessment (J-8) of the Joint Staff

LTC Mark Gibson, USMC, (703) 697-6070

Performer: IDA

Mr. Bruce Harmon, (703) 845-2501

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 96 | \$82,916 | 0.6 |
| | 97 | \$16,854 | 0.1 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 95 | Dec 97 |

Data Base: Title:

Description: Data and model characterizing future rotary wing aircraft inventories and investment costs.

Automation:

Publications: None

Category: II.A.2

Keywords: Government, Programming, Estimating, Weapon Systems, Helicopters, Acquisition Strategy, Production Rate, Cost/Production Function, Case Study

IDA-16

Title: DoD Helicopter Commonality Study

Summary: This task has two major subtasks. (1) in support of the Marine Corps utility helicopter acquisition decision, the study provides an analysis of the costs and savings associated with the alternative approaches to achieving commonality; and (2) in support of commonality issues that may be addressed in the Quadrennial Defense Review, the study provides an assessment of utility and attack helicopter commonality issues and develops a framework for further analyses of the cost implications of commonality.

Classification: Unclassified

Sponsor: OD(PA&E)

Performer: IDA

Mr. Waynard C. Devers, (703) 845-2252

| | | | |
|-------------------|-----------|----------------|--------------------|
| Resources: | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
| | 97 | \$200,000 | 1.3 |

| | | |
|------------------|--------------|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Nov 96 | Jun 98 |

Data Base: None

Publications: Paper due at end of study that provides a framework for evaluating commonality and assesses the cost of Marine Corps utility helicopter options.

Category: I.B.1

Keywords: Government, Estimating, Analysis, Helicopters, Acquisition Strategy, Case Study

IDA-17

Title: Space and Missile Systems Nuclear Hardening Costs

Summary: Investigate relationships between costs and technical characteristics, including nuclear-radiation hardening and other survivability features of selected military satellite and ground-based missile systems. Develop CERs to estimate the marginal costs to harden satellites and missiles against nuclear weapons effects.

Classification: Secret-Restricted Data, Proprietary Information

Sponsor: DSWA/ETD
6801 Telegraph Road
Alexandria, VA 22310-3398
Mr. Michael Rooney, (703) 325-0456

Performer: IDA
Dr. Daniel B. Levine, (703) 845-2562
Dr. Robert Oliver, (703) 578-2981
Dr. David Hunter, (703) 845-2549
Mr. Bernard McHugh, (703) 845-6781

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 94 | \$275,000 | 1.7 |
| 96 | \$275,000 | 1.7 |
| 97 | \$100,000 | 0.6 |
| 98 | \$125,000 | 0.7 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Apr 93 | Dec 98 |

Data Base: *Title:*

Description: Satellite cost data from the Unmanned Space Vehicle Cost Model Version 7 (USCM 7) and from collection by IDA. Missile cost data from U.S. Army and Navy sources. Satellite and missile RDT&E and production costs segregated by subsystem. Satellite and missile technical data, including performance characteristics and nuclear-hardening specifications.

Automation: Excel spreadsheets and Access database

Publications: *Estimating the Costs of Nuclear-Radiation-Hardened Military Satellites*, IDA Paper P-2857, Secret/Restricted Data, November 1994.

Estimating the Costs of Nuclear-Radiation-Hardened-Military Satellites (Unclassified Version), IDA Paper P-3120, April 1996.

Category: II.C

Keywords: Government, Industry, Estimating, Space Systems, Missiles, EMD, Production, WBS, Statistics/Regression, CER, Data Collection, Data Base, Mathematical Model

IDA-18

Title: Cost of Stealth

Summary: The objective of this task is to estimate the cost of obtaining signature reduction for tactical aircraft through (1) adaptation of experiences gained by accomplished programs; and (2) technologies that will contribute to reductions in cost or signature in the future.

Classification: Top Secret/Proprietary Information/Special Access

Sponsor: USD(A&T)
S&TS/AW
The Pentagon, Rm. 3E1081
Washington, DC 20301
Mr. Mutzelburg, (703) 695-0525

Performer: IDA
Dr. J. R. Nelson, (703) 845-2571
Mr. Bruce Harmon, (703) 845-2501
Mr. W. Devers, (703) 845-2252
Dr. R. Bontz, (703) 845-2240

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| prior | \$350,000 | 2.0 |
| 98 | \$150,000 | 0.8 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Oct 96 | Continuing |

Data Base:

Publications: TBD

Category: II.B

Keywords: Government, Estimating, Analysis, Aircraft, EMD, Production, Operations and Support, Schedule, Data Collection, Data Base, Method

IDA-19

Title: Affordable Multi-Missile Manufacturing (AM3)

Summary: IDA will support DARPA/DoD evaluation of missile industry cost reduction initiatives to be submitted in the form of Integrated Portfolio Benefit Analyses. As part of this support, IDA will provide guidance to the industry teams related to analytical ground rules and methods. IDA will comment on the realism of the proposed savings and, where appropriate, recommend adjustments. Summarized findings will be presented as a report, and will be used in the award of Phase III Factory Demonstrations.

Classification: Unclassified

Sponsor: Defense Advanced Research Projects Agency
3701 North Fairfax Drive
Arlington, VA 22203-1714
Dr. Michael F. McGrath, (703) 696-2224

Performer: IDA
Mr. Thomas P. Frazier, (703) 845-2132

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | \$200,000 | 1.25 |
| 97 | \$200,000 | 1.25 |
| 98 | \$225,000 | 1.25 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Nov 95 | Sep 00 |

Data Base:

Publications: TBD

Categories: I.B, I.C, II.A.1, II.A.2

Keywords: Industry, Estimating, Analysis, Missiles, EMD, Production, Operations and Support, Labor, Material, Overhead/Indirect, Engineering, Manufacturing, Acquisition Strategy, Automation, Integration, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Review, CER, Study

IDA-20

Title: Technical and Schedule Risk Assessments for Tactical Aircraft Programs

Summary: This task supports Air Warfare/Strategic and Tactical Systems in providing independent program assessments of technical and schedule risks for tactical aircraft and missiles to the OIPT (Overarching Integrated Product Team) for DAB milestone reviews. This is a continuing project.

Classification: Secret/Proprietary Information

Sponsor: USD(A&T), S&TS/AW
The Pentagon, Rm. 3E1081
Washington, DC 20301
Mr. Gissendanner, (703) 695-7036

Performer: IDA
Dr. J. R. Nelson, (703) 845-2571
Mr. Bruce Harmon, (703) 845-2501

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| prior | \$450,000 | 2.5 |
| 98 | \$50,000 | 0.3 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Feb 92 | Continuing |

Data Base: N/A

Publications: TBD

Category: I.C.2

Keywords: Government, Analysis, Aircraft, EMD, Production, Schedule, Risk/Uncertainty, Data Collection, Data Base, Method

IDA-21

Title: Methods to Assess Schedules for the Strategic Defense System

Summary: The objective of this task is to develop methods for assessing the acquisition schedules of ballistic missile defense systems. The systems include space-based surveillance and interceptor systems, surface-based interceptor systems, and other surface-based elements.

Classification: Unclassified

Sponsor: BMDO/PDE
The Pentagon, Rm. 1E1037
Washington, DC
Ms. Donna Snead, (703) 604-3584

Performer: IDA
Mr. Bruce Harmon, (703) 845-2510

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| prior | \$150,000 | 1.0 |

Schedule: Start End
 Jan 91 Continuing

Data Base: Title:
 Description: Schedule and characteristic data on 26 unmanned spacecraft, 22 missile, and 51 software programs.

Automation: None

Publications: *Assessing Acquisition Schedules for Unmanned Spacecraft*, IDA Paper P-2766, April 1993.

Schedule Assessment Methods for Surface-Launched Interceptors, IDA Paper P-3014, August 1995.

Categories: I.C.2, II.A.2

Keywords: Government, Schedule, Estimating, Method, Statistics/Regression, Space Systems, Missiles, EMD, Production

IDA-22

Title: Resource Analysis for Test and Evaluation

Summary: Analysis of resources devoted to the Major Range and Test Facility Base to include operating cost, investment cost, and personnel resources. Analyses include cost comparisons of alternative approaches to developing test and evaluation capability and realigning workload within existing infrastructure. Evaluation will include identification of efficiencies in management, operations, and resource processing.

Classification: Top Secret

Sponsor: Deputy Director
 Defense Test System Engineering and Evaluation (DTSEE)
 The Pentagon, Rm. 3D1067
 Washington, DC 20301
 Mr. John F. Gehrig, (703) 697-5552

Performer: IDA
 Mr. Charles T. Ackerman, (703) 578-2714
 Mr. Dennis O. Madl, (703) 578-2718

Resources: FY Dollars Staff-years
 98 \$2,000,000 12

Schedule: Start End
 Oct 97 Apr 99

Data Base: Title: T&E Resources
 Description: Operating Cost, Investment Projects, Real Property
 Automation: Hard copy, floppies or hard disk

Publications: *Cost Comparison of the Navy's Air Combat Environment Test and Evaluation Facility (ACETEF) and the Air Force's Electronic Combat Integrated Test (ECIT)*, IDA Paper P-2727, June 1992.

The Need for Unexploded Ordnance Remediation Technology, IDA Document D-1527, October 1992.

Test and Evaluation Reliance - An Assessment, IDA Document D-1829, June 1996.

Category: II.A

Keywords: Government, Analysis, Policy, Programming, Budgeting, Infrastructure, EMD, Test and Evaluation, Operations and Support, Acquisition Strategy, Labor, Overhead/Indirect, Economic Analysis, Study, Data Base

IDA-23

Title: Program Risk Analysis and Management

Summary: The objective of this task is to develop algorithms by which contractors may develop more reasonable risk margins for bidding on production contracts. In addition, the task will investigate mechanisms by which the government may review and monitor contractor risk estimates.

Classification: Unclassified

Sponsor: USD(A&T)
Acquisition Program Integration
Mr. Wayne Abba, (703) 695-5166

Performer: IDA
Dr. Matthew S. Goldberg, (703) 845-2099

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 95 | \$700,000 | 4.0 |
| 96 | \$400,000 | 2.3 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Dec 94 | Sep 98 |

Data Base: N/A

Publications: Final report due at end of project.

Category: I.C.2

Keywords: Industry, Government, Estimating, Review/Monitoring, Budgeting, Production, WBS, Risk/Uncertainty, Acquisition Strategy, Mathematical Modeling, Data Base, Review, Method

IDA-24

Title: Evaluation of TRICARE Program Costs

Summary: The DoD is implementing a congressionally mandated uniform health care benefit, including an HMO option, for beneficiaries eligible for military health care. This new program, called TRICARE, is designed to improve the access to and quality of health care, while not increasing costs to either the government or covered beneficiaries. The objectives of this task are: (1) to compare the costs, both to the government and to covered beneficiaries, of the TRICARE program with those of the traditional benefit of direct care and CHAMPUS; and (2) determine the impact of TRICARE on the out-of-pocket expenses of military retirees.

Classification: Unclassified

Sponsor: OASD(HSO&R)
The Pentagon, Rm. 1D511
Washington, DC 20301
Col. Jerome Luby, (703) 614-4705

Performer: IDA
Dr. Philip M. Lurie, (703) 845-2118

Resources: FY Dollars Staff-years
 97 \$750,000 3.5

Schedule: Start End
 Oct 96 Sep 99

Data Base: None

Publications: None

Categories: II.A.1, II.A.2, II.B

Keywords: Government, Analysis, Policy, Infrastructure, Manpower/Personnel, Test and Evaluation, Variable Costs, Data Collection, Survey, Mathematical Modeling, Economic Analysis, Data Base, Study

IDA-25

Title: Financial Databases of Defense Manufacturers

Summary: IDA has been collecting overhead and related business data on several defense companies since the early 1980s. IDA uses the data to develop statistical models that estimate future total overhead costs and its fixed and variable components by individual company. The data have also been used to analyze other DoD procurement policies, such as profit, progress payments, and reimbursement of contractor IR&D/B&P. This effort involves updating the financial databases and statistical models of six companies and establishing a new database for one company. These data will be structured to ensure consistency with earlier IDA reports and current company accounting procedures. In addition, IDA is developing an automated database for storage, retrieval, and presentation of all the data to facilitate the analytical requirements of OD Cost Analysis Improvement Group (CAIG).

Classification: Unclassified, Proprietary

Sponsor: OD(PA&E)
 Weapon Systems Cost Analysis Division
 The Pentagon, Rm. 2C310
 Washington, DC 20301
 Mr. Gary Pennett, (703) 695-7282

Performer: IDA
 Mr. John Cloos, (703) 845-2506

Resources: FY Dollars Staff-years
 96 \$100,000
 97 \$0
 98 \$0
 99 \$100,000

Schedule: Start End
 94 98

Data Base: Normalized Contractor Account Pools

Publications: Numerous company reports and studies.

Categories: II.A.1, II.A.2

Keywords: Industry, Estimating, Analysis, Aircraft, Airframe, EMD, Production, Overhead/Indirect, Manufacturing, Fixed Costs, Variable Costs, Data Collection, Survey, Economic Analysis, Statistics/Regression, Data Base

IDA-26

Title: Economic Drivers of Defense Overhead Costs

Summary: The objective of this task is to identify the economic and regulatory factors that drive the overhead costs charged by defense firms. A theoretical model of overhead costs from an economic framework will be developed. The model will be used to analyze the relationship of economic factors and DoD regulations on contractor overhead costs under current business practices. The model will also assess how changes in DoD regulations impact the balance of economic forces.

Classification: Unclassified/Company Proprietary

Sponsor: OD(PA&E)
The Pentagon, Rm. 1D311
Washington, DC 20301
Ms. Kristine Kolesar, (703) 697-2999

Performer: IDA
Dr. Thomas Frazier, (703) 845-2132
Dr. Maria Borga, (703) 845-2448524
Dr. Bill Rogerson, (847) 491-8484

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 95 | \$250,000 | |
| 96 | \$250,000 | |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Apr 95 | Sep 99 |

Data Base: **Title:** IDA's Defense Contractor Overhead Data Base, Contractor Cost Data Reports

Description:

Automation: TBD

Publications: *Renegotiation of Fixed Price Contracts on the F-16 Program*, IDA Paper P-3286, December 1996.

Category: II.C

Keywords: Industry, Government, Estimating, Overhead/Indirect, Economic Analysis, Study

IDA-27

Title: DSAMS Cost Estimating

Summary: The Defense Security Assistance Agency (DSAA) is responsible for foreign military sales which includes the sale of weapon systems and replacement parts to foreign nations, and for the training of military and civilian personnel from foreign nations. A major project at DSAA is the migration, integration, upgrade and replacement of 12 legacy systems to support the management of foreign military sales. This project, the Defense Security Assistance Management System (DSAMS), will replace twelve existing, MILDEP-specific, redundant systems which are up to twenty years old and which cost a total of about \$36.5M per year to operate. Existing cost estimates to complete DSAMS need revision because some of the assumptions on which they were based have changed. Therefore, the DSAA requires a new and independent estimate of the cost, schedule and benefit analysis to complete the DSAMS project. The objective of this task is to provide an independent cost, schedule and benefit analysis estimate for design, development and implementation of DSAMS.

Classification: Unclassified

Sponsor: Defense Security Assistance Agency
DSAA Comptroller
Mr. Jim Pollitt, (703) 604-6586

Performer: IDA
Dr. Thomas P. Frazier, (703) 845-2132
Dr. John Bailey, (703) 855-4472

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 97 | \$85,000 | 0.5 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Jul 97 | Mar 98 |

Data Base:

Publications: TBD

Category: I.C.2

Keywords: Government, Estimating, Automation, Software, Study

IDA-28

Title: Active/Reserve Integration

Summary: This work is designed to examine alternative ways to integrate active and reserve forces, particularly in the Army. For Army National Guard combat units, a key aspect of successful integration is being able to mobilize, train, and deploy for combat fast enough to effectively carry out its combat mission. The great uncertainty surrounding how long it would take Guard brigades and divisions to deploy has led this subject to be the focus of work on the task.

Classification: Unclassified

Sponsor: Assistant Secretary of Defense (Reserve Affairs)
The Pentagon, Rm. 2E515
Washington, DC 20301
Mr. Joel Resnick, (703) 695-7305

Performer: IDA
Mr. Stanley A. Horowitz, (703) 845-2450

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 96 | \$175,000 | 1.0 |
| 97 | \$250,000 | 1.4 |
| 98 | \$300,000 | 1.6 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Jan 96 | Dec 97 |

Data Base:

Title:

Description: Plan for mobilization, training, and deployment of a National Guard armored division.

Automation: Microcomputer zip drive

Publications: *Conference on Force Integration: Seeking Better Reserve Component Capability and Credibility*, Institute for Defense Analyses, Document D-1849, May 1996.
Detachment 1, 28th Infantry Division Artillery in Bosnia, Document D-2083, Institute for Defense Analyses, Draft Final, December 1997.

Category: II.C
Keywords: Government, Analysis, Policy, Manpower/Personnel, Readiness, Data Collection, Data Base, Study

IDA-29

Title: Reducing Defense Infrastructure Costs

Summary: This project is designed to find better strategies for managing infrastructure, and thus reducing infrastructure costs. The initial focus is on installation support costs. Service initiatives for developing benchmarks involving the costs and output of different installation support services are being examined. Private sector and other governmental practices are also being studied. The goal is to recommend adoption of an information system and a set of metrics that will allow decision-makers more insight into how to provide the needed installation support at a reduced cost.

Classification: Unclassified

Sponsor: Director, Program Analysis and Evaluation
The Pentagon, Rm. 3E836
Washington, DC 20301
COL Ambrose Hock, (703) 697-4311

Performer: IDA
Mr. Stanley A. Horowitz, (703) 845-2450

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$300,000 | 1.6 |

Schedule:

| <u>Start</u> | <u>End</u> |
|--------------|------------|
| Feb 98 | Jun 99 |

Data Base: TBD

Publications: TBD

Category: II.C

Keywords: Government, Analysis, Policy, Infrastructure, Facilities, Overhead/Indirect, Data Collection, Cost/Production Function, Study

IDA-30

Title: Environmental Costs, Unexploded Ordnance Remediation

Summary: The objective of this task is to identify the cost drivers in the remediation of unexploded ordnance from Department of Defense (DoD) lands. This information will enable the DoD to conduct payback analysis on the introduction of new technology into the remediation process, determine the appropriateness of fixed cost contracts for cleanup, and determine a rational basis for deciding whether or not to attempt to remediate contaminated lands.

Classification: Unclassified

Sponsor: IDA Central Research Project

Performer: IDA
Ms. Christine J. Crabill, (703) 578-2716

Resources: FY Dollars Staff-years
 97 \$15,000 0.2
 98 \$5,000 0.1

Schedule: Start End
 Oct 96 Sep 98

Data Base:

Publications: TBD

Category: I.D

Keywords: Government, Analysis, Facilities, Environment, Study

IDA-31

Title: Defense Economic Planning and Projection Systems (DEPPS)

Summary: Maintain the currency of the Defense Translator within DEPPS by periodically updating the various sections of the translator associated with the appropriations accounts. The Defense Translator accounts for the distribution of defense spending among the industries producing the goods and services that DoD buys, and describes the commodity composition of defense demands.

Classification: Unclassified

Sponsor: OD(PA&E)/RA/EARPD
 The Pentagon, Rm. 2D300
 Washington, DC 20301
 Mr. Paul Dickens, (703) 697-2999

Performer: IDA
 Dr. Thomas Frazier, (703) 845-2132
 Mr. Jeff Card, (703) 845-2212

Resources: FY Dollars Staff-years
 85 \$122,000 1.0
 87 \$182,000 1.5
 88 \$40,000 0.3
 90 \$75,000 0.6
 92 \$60,000 0.5
 93 \$80,000 0.7
 94 \$160,000 1.1
 97 \$30,000 0.2

Schedule: Start End
 Jul 85 Dec 98

Data Base: N/A

Publications: *A Comparison of the DEIMS and the Department of Commerce Translator Vectors*, IDA Paper P-2647, T. P. Frazier, S. K. Welman, and R. H. White, March 1993, Unclassified.
 A User's Manual for the Revised Defense Translator Model, IDA Document D-796, T. P. Frazier and J. B. Tate, June 1990, Unclassified.
 The Revised Defense Translator, IDA Paper P-2141, T. P. Frazier, C. G. Campbell, and R. T. Cheslow, October 1989, Unclassified.

Categories: II.A.1, II.A.2

Keywords: Industry, Government, Analysis, Budgeting, Mathematical Modeling, Economic Analysis, Study

IDA-32

Title: Coast Guard Models

Summary: Analyze the Coast Guard's needs for cost models to support the full spectrum of its cost-estimating needs. Survey the staff of Coast Guard headquarters and examine governing federal and Department of Transportation requirements to develop a statement of cost-modeling requirements. Develop a cost estimating framework that provides a standard Coast Guard structure. Design, prototype, and develop a project oriented, life-cycle cost model that meets the Coast Guard's requirements for developing cost estimates for Planning Proposals prepared by field activities and program change analyses typically performed by Headquarters organizations.

Classification: Unclassified

Sponsor: U.S. Coast Guard Research and Development Center
1082 Shennecossett Road
Groton, CT
Mr. Clark Prichett, (203) 441-2653

Performer: IDA
Mr. James L. Wilson, (703) 845-2469

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> | <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|-----------|----------------|--------------------|
| 93 | \$10,000 | 0.1 | 96 | \$100,000 | 0.6 |
| 94 | \$75,000 | 0.5 | 97 | \$190,000 | 1.1 |
| 95 | \$280,000 | 1.8 | 98 | \$205,000 | 1.2 |

Schedule: Start End
Jul 93 Dec 98

Data Base: None

Publications: Pending

Categories: II.C, II.D

Keywords: Government, Estimating, Life Cycle, Fixed Costs, Variable Costs, Mathematical Modeling, Computer Model

IDA-33

Title: Cost Analysis Education

Summary: IDA collaborated with George Mason University(GMU) in the development and conduct of a graduate-level course in cost analysis during the past six years. This course is one of two core courses in GMU's Military Operations Research curriculum. Course content is focused on the daily problems confronted by defense cost analysts and approaches to solve them. Government employees are invited to attend lectures free of charge. This project supports the development and updating of lecture materials by IDA cost analysts.

Classification: Unclassified

Sponsor: IDA Central Research Program

Performer: IDA
Dr. Stephen Balut, (703) 845-2527

Resources:

| <u>FY</u> | <u>Dollars</u> | <u>Staff-years</u> |
|-----------|----------------|--------------------|
| 98 | \$15,000 | 0.1 |

| | | |
|----------------------|--|------------|
| Schedule: | <u>Start</u> | <u>End</u> |
| | Oct 97 | May 98 |
| Data Base: | None | |
| Publications: | None | |
| Category: | II.A.1 | |
| Keywords: | Government, Analysis, Forces, Weapon Systems, Review | |

- [1] DoD Directive 5000.4, "OSD Cost Analysis Improvement Group (CAIG)." November 24, 1992.
- [2] Stephen J. Balut and Kathryn L. Wilson. "The IDA Cost Research Symposium." Institute for Defense Analyses, Document D-647, August 1989.
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- [4] Stephen J. Balut and Kathryn L. Wilson. "The 1991 Cost Research Symposium." Institute for Defense Analyses, Document D-1003, July 1991.
- [5] Stephen J. Balut. "The 1992 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1204, August 1992.
- [6] Stephen J. Balut. "The 1993 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1414, August 1993.
- [7] Stephen J. Balut. "The 1994 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1569, August 1994.
- [8] Stephen J. Balut. "The 1995 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1754, August 1995.
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- [10] Stephen J. Balut. "The 1997 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-2025, July 1997.
- [11] Office of the Assistant Secretary of Defense (Program Analysis and Evaluation). "DoD Six-Year Cost Research Plan, FY 1993-1998." AD-B170946, 4 January 1993.
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- [13] Stephen J. Balut, Vance Gordon, Theresa O'Brien, Richard Bishop, and Richard Collins. "Status of DoD's Capability to Estimate the Costs of Weapon Systems." Institute for Defense Analyses, Document D-2149, April 1998.

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| REPORT DOCUMENTATION PAGE | | | <i>Form Approved</i> <i>OMB No. 0704-0188</i> | |
|--|---|--|--|--|
| <small>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 2220-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.</small> | | | | |
| 1. AGENCY USE ONLY (Leave blank) | | 2. REPORT DATE August 1998 | 3. REPORT TYPE AND DATES COVERED Final Report, Aug 97-Aug 98 | |
| 4. TITLE AND SUBTITLE "The 1998 IDA Cost Research Symposium" | | | 5. FUNDING NUMBERS DASW01 94C 0054/DASW01 97 C 0056 T-Q7-1138 & CRP 9001-702 | |
| 6. AUTHOR(S) Stephen J. Balut | | | | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Institute for Defense Analyses 1801 N. Beauregard Street Alexandria, VA 22311-1772 | | | 8. PERFORMING ORGANIZATION REPORT NUMBER IDA Document D-2173 | |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Dr. Vance Gordon OSD(PA&E) Room 2E314, The Pentagon Washington, DC 20301 | | | 10. SPONSORING/MONITORING AGENCY REPORT NUMBER | |
| 11. SUPPLEMENTARY NOTES | | | | |
| 12A. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited. | | | 12B. DISTRIBUTION CODE | |
| 13. ABSTRACT (Maximum 200 words) This document contains a catalog of cost research projects discussed at the IDA Cost Research Symposium held on 21 May 1998. Participants included representatives of offices and organizations that sponsor and conduct the research. The purpose of this annual symposium is to facilitate the exchange of research findings and other information in order to avoid wasteful duplication of effort and enhance each organization's ability to conduct research planning for the future. Each project summary included in this document presents the project title, a descriptive summary, classification, sponsor, performer, researchers, schedule, data bases, publications, and keywords. The research directors of the offices and organizations that participated report that catalogs associated with prior symposia (1989 through 1997) have been useful in facilitating the exchange of data, data sources, findings, and reports, thereby contributing to improved efficiency in the cost analysis function within the Department of Defense. | | | | |
| 14. SUBJECT TERMS Cost Analysis | | | 15. NUMBER OF PAGES 249 | |
| | | | 16. PRICE CODE | |
| 17. SECURITY CLASSIFICATION OF REPORT Unclassified | 18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified | 19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified | 20. LIMITATION OF ABSTRACT SAR | |

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102**UNCLASSIFIED**